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Malnutrition—A Challenge and an Opportunity*

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THE title of our paper is taken from a paragraph in the report of a League of Nations Committee on the relation of nutrition to health, agriculture, and economic policy:

> The malnutrition which exists in all countries is at once a challenge and an opportunity; a challenge to men's consciences and an opportunity to eradicate a social evil by methods which will increase economic prosperity.[1]

We may not be directly concerned with the economic effects of our work, nor with its relationship to the campaign for social justice. Nevertheless it is inspiring to consider that in our efforts to deal with a serious health problem, we may be helping to bring about in this troubled world, greater and more widespread economic prosperity, and aiding in the eradication of one important cause of social unrest.

LAG BETWEEN SCIENTIFIC ADVANCES AND THEIR APPLICATION

Public health work has made great progress in the last fifty years because trained men and women have devoted their lives in the laboratory and the field to the study of its problems, adding little by little to our stores of knowledge. Too often the application of new knowledge for the benefit of the mass has been long delayed. The forces of inertia have perpetuated the use of technics and methods of work long after the addition of new knowledge should have rendered them obsolete, and public health programs are planned all too frequently by individuals who ignore the fact that our knowledge of problems and technics and our resources and equipment have advanced with the years.

The promotion of nutrition is a case in point. The great advances in the science of nutrition during the last 25 years have been applied only sparingly. The tax supported agencies entrusted with the care of the public

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health have been in this respect the victims of inertia and tradition. Methods used by the health and school authorities to detect malnutrition and to promote nutrition are very much the same as those applied a quarter of a century ago, and the problem remains vague and ill defined. Social agencies other than the health and school authorities have recognized the importance of a more precise knowledge of the problem and have attempted to apply to it the newer methods developed in the laboratories of biochemistry and physiology. The result is that we do not look to health agencies for advice and help on nutrition problems but to home economists and dietitians, the agricultural schools and land-grant colleges, and universities. These individuals and institutions deserve every credit, and their efforts should be encouraged by every possible means, but their partial capture of this important section of the public health field should not mean avoidance of responsibility by the health agencies.

METHODS OF APPRAISING NUTRITIONAL STATUS AT PRESENT IN USE

Let us subject the statement of the League's committee that malnutrition exists in all countries to some analysis. Certainly cases of pellagra, rickets, scurvy, and beri-beri still occur in large numbers in many countries. Apart from these recognized deficiency diseases we have very little definite information on the extent of malnutrition even in the most advanced countries. For some years several methods of arriving at estimates of the number of malnourished in any group have been at our disposal. First we may study the availability and cost of the foods required for an adequate diet within a community. This however ignores differences in dietary habits of the individuals forming the group. To avoid this error, dietary studies of families and individuals may be made. While these are difficult and costly, they do yield information of value if properly carried out, but of limited value because the individual's state of nutrition does not depend solely on his diet. Another approach has been by way of anthropometric measurements. The deficiencies and limitations of this method have been described clearly in the literature.

Under another plan the adequacy of the diet is appraised by providing extra supplies of protective foods to one group and noting the improvement in height, weight, and physique of that group as compared to a control group.

The clinical examination is another common method of appraising nutrition. The results in this case depend so much on the individual's judgment based on his appreciation of a number of variable factors that, taken alone, it is of limited value for public health use. The fact that the results of the appraisal of identical groups by different clinicians often differ widely is a sufficient criticism.

While some of these methods require perfecting, and others provide only limited or indirect evidence of malnutrition, it would seem that there has been available in the past a series of methods which should have given a rough idea of the extent of the problem of malnutrition in the advanced countries. What use has been made of these methods to define the problem of malnutrition in this country?

EXISTING EVIDENCE OF MALNUTRITION IN THE UNITED STATES OF AMERICA

During the 4 years 1926–1930, surveys were conducted on the dietary habits of families in rural areas in 6 different states; all revealed varying amounts of undernourishment.[2] During the past 5 years this type of study has constantly shown nutritional impairment among a definite proportion

of the urban population. For example, in one survey [3] among 748 low-income families, 21 per cent were found to be receiving diets with an average energy value more than 25 per cent below the accepted standard; while for an additional 25 per cent of the families, the caloric intake was 10 to 25 per cent too low. From the standpoint of diets low in certain essentials, the proportion of families was even higher.

Figures of substantially the same order were obtained in another survey [4] by use of a different technic. Records of food consumption were collected by the U. S. Bureau of Labor Statistics, and the nutritive content of the diets analyzed by the Bureau of Home Economics. Of 897 families of employed workers, only 29 per cent had "Grade A" diets, while 45 per cent had "Grade B," and 26 per cent "Grade C" diets. "Grade A" diets provided "a generous margin of safety in all nutritional essentials"; "Grade B" diets met average minimum requirements with an uncertain margin of safety; while "Grade C" diets failed in one or more respects to meet average minimum requirements. One would expect to find among these families a large number of malnourished individuals in the 26 per cent ("Grade C") group, and a smaller number in the 45 per cent ("Grade B") group. Nearly 90 per cent of the Negro families in this study consumed "B" or "C" diets; the percentage was 70 among white families. This is evidence that there has been a serious nutrition problem in the areas (Pacific, Southern, and North Atlantic cities) in which those families live; it is not precise enough to enable us to select for attention the individual victims of malnutrition.

During the past 5 years at least 10 studies have demonstrated the beneficial effects of supplemental foods in the diets of children, with the obvious inference that the previous dietary was inadequate. One such study [5]—the most recent— on 150 children for 1 year showed that those receiving a supplement made greater progress during the period of observation.

There have been numerous clinical studies of children to determine their state of nutrition. Roberts [6] summarized 13 such investigations carried out between 1906 and 1924, each covering thousands of children. The average percentage adjudged by clinical evidence to be suffering from malnutrition was 22.3. In 1932 the Community Health Center in Philadelphia with an annual medical case load of almost 2,000 cases reported malnutrition among 35 per cent.[7] In 1933 one-third of several hundred children in New York City were rated by clinicians as "poorly" or "very poorly" nourished.[8] Among 28,000 white children from 6 to 15 years of age examined in 21 states from 1928 to 1932, 6 per cent were stated to be malnourished by clinical examination without reference to any standards of height and weight.[9]

In 17 investigations carried out between 1918 and 1924 with the weight-height ratio as a criterion of nutritional status, 32.7 per cent of the persons examined were adjudged to be malnourished.[10] We may be sure that many malnourished children escaped this screen while a considerable number of well nourished were included. Of 5,000 white children from 6 to 9 years of age, examined during 1929 to 1933 in 6 widely scattered cities, 43 per cent were below their age and sex-group average in weight.[11] It should be borne in mind that the statistical averages so determined may not represent the desired standard since 22 per cent were well above this level.

The fact that some 4,000 persons are recorded as dying of pellagra every year in the southern states of this

country is further objective evidence as to the state of public nutrition.

IMPORTANCE OF RAISING STANDARDS

It is to be noted that most of the standards used in these studies relate to average or minimum requirements while modern teaching suggests that we should relate nutrition appraisal to optimum standards. We believe that the area between minimum and optimum requirements will become of increasing importance in future work on nutrition. Minimum requirements are those which prevent signs of nutritional deficiency detectable by the ordinary methods in common use. It is more than probable that there are signs of nutritional deficiency which escape attention at present but which the use of the new methods of appraisal will enable us to discern. Our aim should be not mere existence at just above the level of detectable nutritional deficiencies, but that abounding health and vitality for which human beings have hungered throughout the ages.

A number of leading nutrition experts have expressed the belief that the greatly increased use of the protective foods may constitute a means of attaining greater vitality and possibly longer life. The reported experiments of Sherman seem to point in that direction.

THE LATENT STATE

By analogy with known disease entities, we should expect to find a latent period before certain states of malnutrition declare themselves frankly. It is also probable that in the majority of instances these latent states may clear up with time. It might be argued that nothing need be done about them; but two considerations must be borne in mind. First, experience teaches that the best time to deal with any condition affecting the health of the individual is in its earliest stage, before it has done any permanent damage. Second, if our standards are to provide a safe margin above the minimum, and if we would strive for abounding health rather than for a so-called normal existence on the lowest or average level, we cannot afford to neglect these latent states of malnutrition.

It will be noted that we regard the improvement of nutrition as a medical problem, and the detection of latent states of malnutrition as one of the most important tasks of health agencies. The introduction of precise and objective methods offers a fresh opportunity of appraising nutrition. In what measure are we equipped to carry out that task? In recent years the science of nutrition has so advanced that certain of its contributions are ready for practical application. For example, at least 5 of the vitamins, and in some instances their precursors in the human body, have been isolated; their chemical and physiological properties have been demonstrated and suitable chemical and physiological tests have been worked out, whereby the latent state in several deficiency diseases may be recognized. Many of these tests are being used currently in hospital and dispensary practice, where they have opened the way to new fields of knowledge and to more effective therapy. Disturbances of nutrition are associated with practically every disease to which flesh is heir, and these new methods are helping to define the character and importance of this part of the symptom complex.

At the last Annual Conference of the Milbank Memorial Fund, a distinguished group of clinicians, biochemists, pediatricians and physiologists, was called together to report on these tests. We quote from their report [12]:

> Diagnostic methods have been elaborated for detecting the early stages of the various specific deficiency diseases which are seen in the population, and these tests are in various stages of development. In general they fall

into two groups: physiological and biochemical. Physiological tests are used in detecting the latent state by applying an exaggerated stimulus or stress, and eliciting those signs which occur naturally in the more severe stages of the disease. The chemical tests are performed on the blood or urine where dietary inadequacies or other etiological factors are reflected by low values. Specific tests have been developed, or are in the process of development, for such nutritional disturbances as deficiency in vitamins A, B_1, C, D, protein and iron. (It should be explained that both types of tests have not been developed for all deficiency diseases; nor where they are available, are they developed to the same degree. In some, the physiological test is at the moment superior; in others the advantage rests with the chemical test.) In the opinion of the group, some of these tests have now been perfected to the point where they are ready for trial application to a much wider extent than has been given them in the past.

USE OF NEW PHYSIOLOGICAL AND BIOCHEMICAL TESTS

This is an extremely conservative statement and rightly so. There is no doubt that several of these methods are ready for immediate practical test on a large scale, but a period of trial application under experimental conditions would seem to be a desirable safeguard against the indiscriminate use of any methods not completely developed, and against piecemeal utilization of any one method as sufficient in itself for assessing nutritional status. Just how many tests are reliable enough for routine use, how many should be used, and how they may be used most effectively, are as yet unanswered questions. For routine application in public health work, where large numbers must be dealt with, and where there are limitations in budget and personnel, the specific questions are: How *few* of these tests will give a reliable indication of nutritional status; and how may these tests be applied to large groups as effectively and economically as possible?

Scattered attempts are being made, largely under the leadership of university departments of home economics, to answer these questions. A comprehensive study is being planned on a coöperative basis by the Departments of Preventive Medicine and Pediatrics of Cornell University, the U. S. Public Health Service, the New York City Department of Health, and the Milbank Memorial Fund.

Plans under consideration call for medical as well as dietary histories of a large group of children. In the medical history more than the usual emphasis will be placed on the occurrence of infections, amount of sleep, amount and type of activity, and exposure to sunlight.

The physical examination will include selected measurements and be supplemented by a dental examination. Among the physiological tests will be measurement of visual dark adaptation and the neuromuscular response to galvanic stimuli. Roentgenograms will make possible a study of the skeletal system. Examination of the blood will include a red cell count, determination of the concentration of hemoglobin, an hematocrit reading of the proportion of corpuscles, a total and differential white cell count. Biochemical tests will be used to measure the concentration of ascorbic acid, calcium, phosphorus, and phosphatase in the blood. The thorough clinical examination will be supplemented by stethographic and electrocardiographic recordings of the heart sounds and conduction patterns. Urine examinations for sugar and albumin will be carried out. Finally, there will be a serological test for syphilis and a Mantoux test.

This is an extraordinary number of tests to apply to a population, and we do not believe that it will be practicable widely to generalize such studies. This is essentially an experimental study with the object of selecting those tests and methods which may be recommended for routine use in appraising

nutritional status. The task we have undertaken is difficult and time consuming, and our results will need confirmation by other workers. We wish to emphasize that the ultimate object is to determine the size, the nature, and the distribution of the nutritional problem. Such knowledge is essential if we are to raise the nutritional level of our people. Without accepted methods of ascertaining the individual's state, the nutrition work now being carried on cannot be sharply focused on the malnourished. For lack of such methods the results of the educational work in nutrition, on which much time and money are being spent, cannot be closely evaluated. Finally, the absence of such methods makes it difficult to supplant debate by demonstration on whether, or to what extent, impaired nutrition may play a part as a predisposing factor in parasitic diseases, such as tuberculosis; as well as the part played by satisfactory nutrition in building up resistance against such disease.

THE CHALLENGE TO THE OFFICIAL HEALTH AGENCIES

If the League's committee is correct in its view that the malnutrition existing in all countries is a challenge and an opportunity, that challenge and that opportunity are of the greatest importance to the health agencies, for to them has been entrusted the care of the public health. We have suggested that these agencies have been somewhat handicapped by tradition and have failed to advance as rapidly as increasing knowledge of nutritional science would appear to permit. The opportunity presented by malnutrition has been seized by other social agencies which are attempting to apply for public benefit the newer knowledge of nutritional science. We cannot place obstacles in the path of any agency which is doing good work in this field, but we can review our own position, adapt our own program to the new knowledge and the new opportunities and join with these other agencies in the attempt to use the new weapons of science in the cause of greater social progress. The U. S. Public Health Service has set a splendid example by its recognition of the importance of nutrition in the public health field. It has helped to advance our knowledge of the science, and carried out critical studies of the means now used to apply that knowledge. Nor has the U. S. Children's Bureau failed to appreciate the importance of the factor of nutrition in infant and maternal welfare.

We believe that the American Public Health Association is in a position to provide at least some of the leadership needed by the public health agencies in their effort to meet the challenge of the widespread existence of malnutrition. It is our earnest hope that the challenge will be met and the opportunity seized as rapidly and adequately as possible.

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Knowledge and Wisdom

"Man has grown exceedingly powerful. . . . He has gained in knowledge and skill at a rate which in modern times can be likened only to the ascent of a skyrocket. . . .

Thus we have grown marvellously powerful and clever in our means for achieving our purposes. But in the wisdom of our choice of purposes to be achieved we have at best marked time; when, with the advancement of our powers for good and ill, the problem of adjusting our standards of value to the new conditions has become superlatively urgent.

We may well ask: Has an immature human race stumbled upon a dangerous toy? Are we children playing with a loaded gun? Shall we grow up in wisdom before tragedy engulfs us? Is this the riddle of the Sphinx, to fail in which means destruction? Or may we perhaps look forward to an era of an awakening in wisdom, commensurate with the rocket-like ascent in knowledge? Should this come about, then Utopia, from an idle dream, would become a real presence." — Alfred J. Lotka, Contact Points of Population Study with Related Branches of Science. *Proc. Am. Philosophical Society,* Feb. 15, 1939, p. 624.

A Comparison of Indices Used in Judging the Physical Fitness of School Children*†

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WITH the public conscience demanding protection of the health of the child and the school medical services expanding to meet this need, the development of a simple, economical, but accurate means of assessing the child's state of well-being or physical fitness is in order. During recent years many workers in the field of child health and growth have recommended different indices of body build as a step in the solution to this problem. Clinicians have recognized that the use of such an index is only one of the tools at their command for evaluating the individual child's state of well-being, and that the child's past history, his individual growth pattern, the evidences of nutritional deficiencies, such as rickets or anemia, as well as of organic disease, are also of significance. But such a highly refined examination, including laboratory procedures, is not practical in the ordinary school health program, so that there is a need to determine which of the various methods of assessment may be both easy to apply and productive of results.

To help clarify this situation the U. S. Children's Bureau, the Institute of Human Relations, and the Department of Pediatrics of the Yale University School of Medicine undertook a study of 713 seven year old white boys ‡ and girls living in New Haven, Conn., during 1934–1936.** The primary objective of this investigation was to study and compare various procedures used in evaluating the child's health. A full and detailed report is in preparation at the present time. This paper is concerned only with a limited aspect of the whole problem; namely, the ability of each of four indices of body build to identify children who are likely to be physically unfit, using as criteria of reference (1) the findings of the physician with respect to the child's general nutritional condition, and (2) the child's annual rate of gain in weight.

* Read at a Joint Session of the Child Hygiene and Food and Nutrition Sections of the American Public Health Association at the Sixty-seventh Annual Meeting in Kansas City, Mo., October 25, 1938.

† From the Children's Bureau, U. S. Department of Labor, with the coöperation of the Institute of Human Relations of Yale University, and the Department of Pediatrics of the Yale University School of Medicine. Grateful acknowledgment is made to Frank K. Shuttleworth, Ph.D., for assistance in planning and directing the study.

‡ Age is defined in completed years last birthday.

** The children were first examined when they were 6 years old, but the analyses are based on the observations made when these boys and girls were 7 years of age.

This study has one particular advantage: All the indices have been applied to the same group of children, and probably for the first time there are available direct comparisons of the ability of the several indices to identify boys and girls who may be in need of medical attention or nutritional assistance. The indices studied include, first, the Baldwin-Wood height-weight index; second, the Pryor width-weight index, which is an elaboration of the Baldwin-Wood standard; third, the Nutritional Status Indices developed by Franzen and his coworkers in the American Child Health Association; and fourth, the ACH (arm-chest-hip) index, which was also developed by that group.

The assumptions inherent in the development of such indices of body build and the applicability of the statistical methods used in deriving the indices and identifying children who may be in a poor physical condition deserve careful consideration. It is also important to know the kind and number of children whose measurements were used in forming the indices. All these problems are important, but the school health officer is primarily interested in knowing whether an index works; that is, whether it is able to pick out children who may be physically unfit. The New Haven study attempts to answer this question in respect to 7 year old children.

In applying and testing these four indices, the prescribed procedures as laid down in the original reports have been followed. According to the Baldwin-Wood index a child less than 10 years of age is underweight if his actual weight is 6 or more per cent less than his expected weight. The Nutritional Status Indices of Franzen make it possible to determine a child's standing, relative to his skeletal peers, in each of three "traits"—arm girth, weight, and subcutaneous tissue. As Franzen has not indicated the percentage of children who are likely to be physically unfit, each index has been set to identify, for the purpose of this study, the lowest 15 per cent of the boys and girls.* The children thus selected have been defined arbitrarily as the group most likely to be in need of medical care or nutritional assistance. A similar procedure for identifying the lowest 15 per cent of the children has also been employed in the New Haven Study for testing the Pryor width-weight index,† while the ACH index has been set to pick out the lowest 14 per cent of the group of boys or girls included in the study.

All white children who were of single, legitimate birth, who were between 6 and 7 years of age when the first physical examination was made, and who were attending the public or parochial schools of New Haven, Conn., were eligible for inclusion. A single pediatrician made two annual physical examinations of each child. At the same time a single technician trained in anthropometry took the necessary anthropometric measurements according to the prescribed technics. The child's medical history and his socio-economic status were ascertained, and he was weighed at quarterly intervals during the 19–20 month period of observation. Except for hemoglobin and red blood cell tests of 133 of these children, no attempts were made to refine the clinical examinations with laboratory tests of the child's physiological state.

A single case history may serve to illustrate the different kinds of observations which were made on each child.

J. K. was a little Polish girl who lived with her mother and an older brother and sister

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* Table X, *Nutritional Status Indices*, p. 65. American Child Health Association. New York, 1935.

† The method has not been outlined in any of Dr. Pryor's papers, but she has approved this procedure, which corresponds approximately to the method used in testing the Nutritional Status Indices.

in the central part of New Haven. The family income was very low both years of the study—only about $545 when J. K. was 7 years old. The child's diet was necessarily poor in amount and quality. Vegetables, fresh fruit, and meat were served about twice a week, eggs even less frequently. On the other hand, J. K. usually had two to three cups of milk a day. She regularly attended the infant and child health conference in New Haven until she was 2 years old. Her medical history was negative except for whooping cough at 3 years of age.

This little girl was relatively small for her age. At 7 years she weighed about 7 pounds less than the average girl included in the study, was 1 to 2 inches shorter, and more than 1 centimeter narrower at the hips (bitrochanteric width). Her weight gain between the two physical examinations was very unsatisfactory. Between 6 and 7 years of age she gained less than half as much as the average girl included in the study.

According to the physician's judgment she was poorly nourished at the time of both annual physical examinations. The most important clinical findings included the following items: The amount and condition of the child's subcutaneous fat and musculature were recorded as poor at both 6 and 7 years of age; the two 6 year molars which erupted in the interval between the physical examinations as well as the two which had erupted earlier were all carious when the second examination was made. There was also a moderate deficiency in hemoglobin (84 per cent),* and a somewhat lowered red-blood count (4,240,000).

The child had several illnesses during the period of observation. She had measles 4 months after the first examination was made, and just before the second examination she suffered from an acute upper respiratory tract infection and a rather severe gastro-intestinal upset.

The question before us is then: Do the indices indicate that this child was in a poor physical condition at 7 years of age? She was identified as under par by the Baldwin-Wood index. According to this index she was found to be about 7 per cent underweight, but the Pryor width-weight index and the ACH index failed to identify her as below par. The Nutritional Status Indices of Franzen indicated that both her subcutaneous tissue and weight were within normal limits but that her arm girth was much smaller than would have been expected (86 per cent of the girls with the same body build would have had a larger arm girth). Of course, these results should be interpreted cautiously in so far as the child's well-being is concerned, for it should be remembered that none of the indices or tables attempts to evaluate physical fitness as such but only in so far as it is related to such measures as the child's weight, arm girth, subcutaneous tissue, or the difference between arm girth and chest depth estimated in terms of body build as defined by each index. It should also be pointed out that these findings are of interest only in reflecting the ability of the indices to evaluate this particular child's physical condition.

The more important question whether the indices identify the majority of the children who are physically unfit can be answered only by comparing each of the four indices with other criteria of physical fitness. For example, the boys and girls whom the physician judged to be poorly or very poorly nourished at 7 years of age were compared with the children who were identified by an index as likely to be in a poor physical condition. Similarly, the boys and girls who exhibited an unsatisfactory percentage weight gain between 6 and 7 years of age were compared with the children who were selected by each index. Other and even more restricted criteria, involving both clinical judgment and estimates of gain in weight or increase in arm girth, also were applied.

In this preliminary report it is possible to present only two comparisons. The first concerns the agreement between the physician's clinical judgment and each of the indices. The physician

* The Haden-Hauser hemoglobinometer was used for estimating hemoglobin. These determinations were made 17 weeks following the second physical examination.

who examined these children classified 40 of the 348 girls as poorly nourished at 7 years of age. The Baldwin–Wood index identified 25 girls, or 63 per cent of these 40 children, as underweight. When the Pryor width-weight index was applied only 28 per cent of the 40 girls were picked out as underweight, and with the ACH index the percentage identified as below par was apparently somewhat less (10 per cent). The results of testing the Nutritional Status Indices of Franzen appear to be even more discouraging. The weight index identified only 3 per cent, and the indices for arm girth and subcutaneous tissue picked out 5 per cent of the 40 girls whom the physician judged to be poorly nourished at 7 years of age. Although these percentages are based on a very small number of children, it should be remembered that according to one physician's judgment these 40 girls represent the more extreme cases of poor nutrition. Although her clinical judgment is liable to a certain amount of error, is it not reasonable to expect that even for such a small number of children there would have been better agreement between the clinical judgment of the child's general nutritional status and any one of the indices if the physician and the index were each attempting to measure the same phenomenon?

The second comparison is between annual percentage gain in weight—a more objective criterion than clinical judgment—and each of the indices applied when the children were 7 years of age. Assuming that the children who exhibited an unsatisfactory percentage gain in weight (those in the lowest 10 per cent of the group) were likely to be in a poor physical condition, the results, so far as showing the usefulness of any of the four indices, are even more discouraging. The percentage of such children identified by any one of the indices is very low. The Baldwin–Wood index showed the maximum agreement, only 29 per cent, while the Nutritional Status Index for weight failed to identify any of the 35 girls whose weight gain was considered very unsatisfactory. Here again the results should be interpreted cautiously, for the percentages are based on only 35 children. It should be remembered, however, that their weight gain was exceeded by 90 per cent of the girls who were included in the study.

These findings pertain only to the girls.* Similar analyses indicate that the indices also failed to identify a large number of the boys whom the physician judged to be poorly nourished or whose weight gain was markedly below average.†

Of course neither of these two criteria—clinical judgment and the child's percentage gain in weight—is an entirely satisfactory method for assessing the total physical well-being of the child. This does not mean, however, that they cannot be used to furnish evidence for judging the validity of the indices. On the contrary, one may expect that a large proportion of the children who are selected by these criteria should also be identified by the indices.

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* The evidence presented in this paper may be substantiated by ascertaining the percentage of the 348 girls who must be identified by each index (except the ACH index which does not permit of such an analysis) in order to include the 40 girls whom the physician found to be poorly or very poorly nourished. These percentages are as follows: For the Baldwin-Wood index, 79.5 per cent; the Pryor index, 81.8 per cent; the Nutritional Status Index for weight, 89.0 per cent, for arm girth, 84.1 per cent, and for subcutaneous tissue, 93.1 per cent.

The percentages for including the 35 girls whose weight gain was unsatisfactory are 98.6 for the Baldwin-Wood index; 97.7 for the Pryor width-weight index; 98.6 per cent, 100 per cent, and 97.7 per cent, respectively, for the Franzen weight, arm girth, and subcutaneous tissue indices. Thus it is necessary to set the Pryor index to identify 97.7 per cent of the 348 girls in order to include the 35 girls who showed an unsatisfactory weight gain.

† If the ACH, Pryor, and Nutritional Status Indices are set to identify the lowest 20 per cent instead of the lowest 15 per cent of the children, the agreement between the indices and each of the two criteria, clinical judgment and gain in weight, is also unsatisfactory.

If such indices do not furnish the school health officer with a satsifactory method of identifying a child who may be in need of medical attention or nutritional assistance, what procedures should he use? At the present time the clinical examination must certainly form an integral part of the assessment, especially if determining the need of medical care is to be one of the objectives of a school health program. On the other hand, a great deal can be done to improve the clinical examination and to make the physician's judgment more stable and objective. Provision must also be made for observing the child at regular intervals so that his physical condition can be evaluated in terms of his own previous growth and health. Until the physician is furnished with more satisfactory and practical tools for evaluating the child's physical fitness, it may also be wise to supplement the clinical examination with some simple measure of the child's progress, such as his relative gain in weight. Observations made on the 713 children included in this study are being used to investigate this problem.

SUMMARY

Four indices—the Baldwin–Wood index, the ACH and Nutritional Status Indices of Franzen, and the Pryor Width–Weight index were applied to 713 seven year old boys and girls, who were observed for a period of 19 to 20 months in New Haven, Conn., during 1934–1936. The indices failed to identify many New Haven children whom the physician found to be poorly nourished or who exhibited a very unsatisfactory percentage gain in weight. A more comprehensive and detailed report of this study is in the process of preparation.

A STUDENT has unusual opportunities to court instruction during a visit with the college physician, whether the purpose of his call be for diagnosis or treatment of a specific ailment or for medical advice on some general problem, or because of some difficulty with the administration or some emotional value. In the doctor's office or infirmary the student is exposed to other situations which have distinct educational value. He should learn the methods of a well equipped physician working in a "model" office. He shoulld learn something of the doctor's problems of diagnosis and therapy, he should learn what to expect of medical procedures and the value to him of seeking early medical attention. He should learn something about the use and abuse of drugs, and should learn to interpret medical articles and advertisements. He should learn how to discriminate between sound and unsound medical practice.—C. E. Shepard, *Journal-Lancet*, Feb., 1939, p. 70.

Sanitary Condition of Paper Containers for Retail Packaging of Perishable Foods*

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A STUDY has been made during the past two years of paper wrappers and containers for perishable foods. The work has included bacteriological studies of seven types of paper containers for milk and milk products, and a study of the sanitary condition of the paperboard out of which the containers are made.

IMPORTANCE OF CLEAN, SANITARY PAPERBOARD

As shown in Table I, paperboard made from mixed waste papers may yield bacterial counts of 1,000 to 40,000 colonies per gram. It is generally agreed that paper stock that has previously been used for commercial purposes should not be employed as packaging materials for perishable foods. High bacterial counts and the presence of miscellaneous foreign matter, dirt, ink, and waste in this secondary stock render it decidedly unsuitable for contact with foods. Food wrappers and containers should be made of virgin stock which may be processed and fabricated so as to yield paper products that are essentially sterile.

In contrast to the class of materials containing secondary stock, this table also presents bacterial counts obtained from paperboard used for milk and other food containers. These were made entirely from virgin stock. The latter counts usually vary from essential sterility to 500 colonies per gm. Bacterial counts of paperboard consisting of virgin pulp have during the past year been steadily decreasing. The percentage of paperboard samples approaching essential sterility is on the increase.

The bacteriological results are obtained by reconverting samples of paperboard under aseptic conditions, to pulp suspensions and analyzing the disintegrated paper. The device employed for this purpose previously described in detail [1] consists of a motor of the type used for food mixers, equipped with two fan-type beaters.† Bacteriological findings thus far indicate that paperboard having low bacterial counts yields containers which are nearly or actually sterile. While rinse tests may not reveal differences in

* Approved by the Director of the New York State Agricultural Experiment Station for publication as Journal Paper No. 301, December 10, 1938. Read before the Food and Nutrition Section of the American Public Health Association at the Sixty-seventh Annual Meeting in Kansas City, Mo., October 28, 1938.

† Arrangements are being made with the usual laboratory supply houses such as Fischer Scientific Materials Company, Pittsburgh, Pa., and the Will Corporation, Rochester, N. Y., to list this adapted equipment in complete form. Cost about $20.

TABLE I

Bacterial Counts per Gram of Disintegrated Paperboard Obtained Between July, 1937, and October, 1938

Grades of Paper	Total Number Tests	Percentage Showing No Growth	Percentage Yielding Counts Between 1–50	51–100	101–250	251–500	501–1,000	1,001–10,000	10,001–40,000
Paperboard of Virgin Stock									
Milk container board	824	5	30	26	21	10	8	0	0
Ice cream and butter boxes; cup, plate, cap stock	77	4	47	35	7	5	2	0	0
Paper straws	25	44	56	0	0	0	0	0	0
Paperboard containing Secondary Stock									
Fiber cans, breakfast food cartons, etc.	52	0	0	0	0	10	8	48	34

counts where a large majority of the containers give less than 5 colonies per container, the rinsing and incubation of containers with sterile broth is a useful method of determining the presence or absence of demonstrable organisms. This testing may be performed by introducing 10 cc. of sterile nutrient broth into each container, followed by shaking in the usual manner, but incubating the medium in the container. After incubation, containers are examined for the presence or absence of growth. Table II shows certain relationships of board counts and waxing efficiency to container contamination.

The results of this investigation indicate that cleanliness and freedom from bacteria in paper containers for milk and milk products depend upon the use of a foundation board that is clean and free from bacteria, also the maintenance of this condition through proper methods of handling and storage. Efficient paraffining of high quality paperboard tends to suppress or "seal in" the few cells remaining in high class paper stock. Testing finished containers with sterile nutrient broth aids in revealing the effects of high

TABLE II

Correlations Between Bacterial Counts of Paperboard and Contamination of Finished Containers

Container Type	Source of Paperboard	Paperboard Counts Colonies per Gram	Finished Containers: Number Containers in Series	Finished Containers: Percentage Sterile in Broth	Finished Containers: Rinse Counts. Percentage Yielding Less than 5 Colonies per Container	Moisture Proofing
1	Mill A	Less than 100	1,003	77	96	Good
1	Mill I	Less than 250	2,335	14	93	Variable
2	Mill B	Less than 100	210	68	83	Good
2	Mill K	Less than 500	617	16	66	Variable
3	Mill G	Less than 500	695	16	73	Variable
4	Mill B	Less than 100	180	67	83	Variable

TABLE III

Influence of Temperatures of Paraffining on Bacteriological Tests of Finished Containers

			Finished Containers		
				Rinse Counts	
Paraffining Temperatures	*Number Containers in Series*	*Board Counts Colonies per Gram*	*Percentage Sterile in Broth*	*Percentage Showing No Growth*	*Percentage Yielding Less than 5 Colonies*
165° F.	730	Less than 250	82	66	96
180° F.	1,370	Less than 250	18	62	95

quality paperboard and efficient paraffining on the percentage sterility of the containers.

Over 90 per cent of the organisms isolated from container rinses were spore-formers and micrococci. The remaining types consisted of sarcinae, actinomyces, and filamentous fungi. This flora, which is typically heat-resistant and dryness-resistant, is characteristic of the organisms found in paperboard.

INFLUENCE OF EFFICIENT MOISTURE-PROOFING

The effectiveness of paraffin coating has a marked influence upon the results of bacteriological tests on fabricated containers. Where methods of paraffining produce continuous coatings of wax over paperboard surfaces with effective sealing of corners, edges, and interstices, bacteriological findings show appreciable improvements over containers subjected to mediocre paraffining.

Table III indicates the significance of temperature, which is one of the factors influencing paraffining efficiency.

Generally speaking, more satisfactory coatings of wax were obtained at 165° to 170° F. than at temperatures of 180 to 185° F. Other factors, such as the physical properties of the sheet (porosity, smoothness of surface, formation, etc.) method of paraffining and draining, temperature of container before and after paraffining, and characteristics of paraffin used, also affect moisture-proofing efficiency. With the use of higher paraffining temperatures and slow cooling, while better penetra-

TABLE IV

Comparison of Results Secured with Four Different Rinse Methods Using Standard Nutrient Agar with Incubation at 37° C. for 48 Hours

	Percentage		
Methods	*Showing No Growth*	*Yielding Less than 5 Colonies per Container*	*Total Number Containers Examined*
Rinse 10 ml.			
8 ml. in 3 regular plates	48	92	1,561
8 ml. in 1 large plate	63	96	1,120
Rinse 20 ml.			
10 ml. in 3 regular plates	60	91	860
10 ml. in 1 large plate	64	94	770
			4,311

tion is usually secured than at lower temperatures, there is a tendency for excessive run-off of paraffin from side seams and from parts of containers having extra thicknesses of paperboard, leaving exposed uncoated areas which are capable of absorbing milk and other liquids. The primary purpose of moisture-proofing treatments of essentially sterile paperboard is to render the product non-absorbent. Paperboard specifications and paraffining procedures should be established which will result in efficient moisture proofing.

BACTERIOLOGICAL EXAMINATION OF PAPER MILK CONTAINERS BY RINSE METHODS

Various rinsing and plating methods are under investigation. Table IV presents the results of plate counts obtained by rinsing one type of container with sterile water. This was a coöperative experiment in which 5 different laboratories, using the same methods and technic, participated.

These figures reveal only small differences among the rinse procedures used. As previously stated, however, where containers have so few microorganisms, it is helpful to supplement plating methods with a sterility test in which 10 cc. of sterile nutrient broth is added to each container.

Counts between 6 and 100 organisms per container are sometimes obtained and a few scattering ones that are over 100. The results presented in Table V show rinse counts obtained on 7 types of paper containers for milk, tested during 1937 and 1938.

During the present year marked improvements have taken place in the bacteriological condition of both paperboard and finished containers over the results obtained a year ago. Effective programs of cleanliness and microbiological control at pulp and paper mills and container factories are directly responsible for improved sanitary quality in containers for perishable foods. It is possible that the goal that the industry has set, namely, uniform sterility of paper products where these are used as containers and wrappers for perishable foods may eventually be achieved. In addition to paper containers, bottle caps, gaskets, and similar articles for milk and milk products, containers for ice cream, cheese, butter, and frozen foods; wrappers for bread, meat, butter, fruits and vegetables; also paper straws and trays are included in this investigation.

TABLE V

Rinse Counts Obtained from Various Types of Containers

		Rinse Counts per Container During 1937						*Rinse Counts per Container During 1938*					
Container Type	*Total Number Examined*	*Percentage Showing No Growth*	*0–5*	*6–100*	*101–250*	*251–500*	*500+*	*Percentage Showing No Growth*	*0–5*	*6–100*	*101–250*	*251–500*	*500+*
1	4,787	43	88	10	1.5	0.14	0.36	57	93	6	0.93	0	0.07
2	1,523	9	85	10	1	0.7	0.3	31	76	20	2.0	0.4	1.6
3	1,299	0.5	13	80	3	1.4	2.6	22	70	27	0.7	0.3	2.0
4	180	..	..	..	..	..	..	34	83	15	0.3	0	1.7
5	70	..	..	..	..	..	..	37	87	12	1	0	0
6	120	18	71	27	2	0	0	..	..	..	..	..	..
7	74	12	60	36	4	0	0	..	..	..	..	..	..

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1. Sanborn, J. R. Disintegration of Paper Board for Bacteriological Examination. *A.J.P.H.*, 28:576–578 (May), 1938.

Specific and Nonspecific Serum Treatment of Scarlet Fever*

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THE serum treatment of moderately severe scarlet fever is common practice in communicable disease hospitals, and either convalescent serum or antitoxin is generally given by the intramuscular route. The usual dose for the former is 30 cc., and for the latter, one therapeutic dose (6–10 cc.). In some fever hospitals all patients with scarlet fever are treated with serum, and as a rule this is antitoxin. In others serum is administered intravenously whether it be convalescent serum or antitoxin, and although the therapeutic effect is somewhat better and more dramatic, still there is a hazard in such use. At the Herman Kiefer Hospital both sera are used. Prior to 1930 treatment was largely restricted to use of antitoxin, but since that time convalescent serum when available has largely displaced antitoxin because sensitivity to horse serum is thus avoided. There are proponents of both convalescent serum and antitoxin, but the literature reveals no studies carried out on large numbers of patients where both sera were used during the same epidemic on alternate patients. Such a study was begun August 1, 1936, and carried on for one year. The fiscal year was divided for study purposes into 2 periods of 6 months each, the reason for which will become apparent later.

During the first 6 months, convalescent serum and antitoxin were given to alternate patients who on admission appeared to have exhibited scarlet fever of a moderately severe grade. The determination of the severity of the case and the necessity for serum was the responsibility of two resident physicians (chief and senior) who have been on the Communicable Disease Service for over 10 years. They had no part in the choice of serum to be used. Whenever the serum sensitivity test was positive when antitoxin was to be administered, convalescent serum was given instead, and the case was excluded from the series. The next patient needing serum was given antitoxin if the sensitivity test was negative. Serum was administered in the admitting room prior to removal of the patient to the scarlet fever pavilion.

The scarlet fever convalescent serum used was obtained from recently recovered donors bled in the Department

* Read at a Joint Session of the Health Officers, Laboratory, and Epidemiology Sections of the American Public Health Association at the Sixty-seventh Annual Meeting in Kansas City, Mo., October 28, 1938. (This study was aided by WPA Project No. 82-4-120).

of Health Serum Clinic, and each batch of serum represented the contribution of about 10 donors. Thirty-three samples of serum from as many batches were tested for antitoxin content by the Veldee rabbit ear method, and no batch contained more than 2 units per cc. The dose was 30 cc., and a patient received no more than 60 units of antitoxin when convalescent serum was administered. The scarlet fever antitoxin used was obtained from the Laboratories of the Michigan State Department of Health, and each therapeutic dose (10 cc.) contained a minimum of 6,000 units. The ratio, then, of antitoxin in scarlet fever antitoxin to that in scarlet fever convalescent serum was roughly of the order of 100:1.

The data obtained during the 6 month period were the result of treating alternate cases of moderately severe scarlet fever with convalescent serum and antitoxin. The method of serum assignment was expected to result in comparable groups. To try this assumption, the serum groups were tested with respect to the following important characteristics: distribution of cases by month, by age, by temperature on admission to hospital, by day of disease treatment was begun, and finally by the proportion of cases with significant associated conditions. The two serum groups did not differ with respect to the characteristics considered, and for our purpose may be looked upon as comparable in all respects except kind of serum administered.

RESULTS OF TREATMENT FOR THE 6 MONTH PERIOD, AUGUST 1, 1936, THROUGH JANUARY 31, 1937

During the first 6 months of the study 346 patients with moderately severe scarlet fever were admitted to the Communicable Disease Service. A few patients who belied their real condition upon admission to hospital were originally in the series but obviously did not belong there because they were of the toxic or septic type necessitating different treatment. The elimination of such cases accounts for the slight discrepancy in the serum group totals. One dose of convalescent serum was given intramuscularly to 177 patients while 169 received one dose of scarlet fever antitoxin by the same route.

Augmented Treatment—Whenever a patient showed no improvement in clinical condition, or the admission temperature had been maintained or risen during a 24 hour period following serum treatment, an additional dose of serum was administered. When this was found necessary, it was charged as a failure against the serum originally administered. Cases with such augmented treatment were excluded from the study in order that the value of one dose of either serum might be determined. In Table I the number of cases in which augmented treatment was necessary is shown for both convalescent serum and antitoxin. Additional serum was administered in 14 cases in which convalescent serum was initially used, compared to 11 patients among the group given antitoxin. One case subtracted from the convalescent group and added to the antitoxin group would change the proportion but slightly, and when tested statistically no significant difference is demonstrated.

TABLE I

Serum Treatment of Scarlet Fever

Number and Proportion of Cases with Augmented Treatment by Type of Serum Used

Serum	*Total Cases*	*Augmented Treatment*	*Per cent Aug. Treatment*
Convalescent	177	14	7.9
Antitoxin	169	11	6.5

Temperature Pattern — Cases were classified into 3 groups in relation to the effect of serum on temperature. The first group includes cases in which

the temperature declined to normal or to within 1 degree of normal within 24 hours of serum administration, the temperature remaining normal thereafter for a minimum of 5 days. The second group contains cases in which temperatures declined by lysis within 5 days, a reaction considered average for moderate cases of scarlet fever treated without serum. The third group consisted of patients whose fever continued for a period longer than 5 days. When the two sera are compared on the basis of this classification, no noteworthy difference is demonstrated (Table II).

TABLE II

Serum Treatment of Scarlet Fever

Temperature Pattern of Cases by Type of Serum Used

Temperature Pattern	Number of Cases		Per cent of Total Cases	
	C	A	C	A
Normal	88	88	54.0	55.7
Lysis (5 days)	46	40	28.2	25.3
Con't fever	29	30	17.8	19.0
Totals	163	158	100.0	100.0

Uncomplicated Cases—Scarlet fever is a disease in which complications are quite prevalent, and in general it may be stated that slightly over one-half of the hospital cases of a moderately severe grade will develop complications of one sort or another. In Table III, the number and proportion of uncomplicated cases are shown by type of serum used. A comparison of the two sera with respect to this factor shows little difference.

TABLE III

Serum Treatment of Scarlet Fever

Uncomplicated Cases by Type of Serum Used

Serum	Total Cases	Uncomplicated Cases	Per cent Uncomplicated
Convalescent	163	70	43.0
Antitoxin	158	68	43.7

Occurrence of Complications—Certain complications occur with greater frequency in scarlet fever than others. The commonest in hospital practice are rhinitis, cervical adenitis, and suppurative otitis media, in the order named. In Table IV the complications noted during the first 6 month period are listed with respect to frequency, proportion, and the type of serum used. Rhinitis and cervical adenitis occurred with the same frequency. The incidence of suppurative otitis media as well as the remainder of the complications shown in the table occurred too infrequently to warrant analysis.

Proportion of Cases with Multiple Complications—The complication analysis was carried one step further by determining the number of complica-

TABLE IV

Serum Treatment of Scarlet Fever

Occurrence of Complications by Type of Serum Used

Complications	Convalescent		Antitoxin	
	No.	Per cent	No.	Per cent
Otitis media, cat.	5	3.1	9	5.7
Otitis media, supp.	9	5.5	11	7.0
Mastoiditis	2	1.2	3	1.9
Ethmoiditis	2	1.2	2	1.3
Rhinitis	65	39.9	63	39.9
Angina, post-scarlatinal	5	3.1	..	....
Cerv. adenitis, non-supp.	38	23.3	37	23.4
Arthritis	5	3.1	4	2.5
Carditis	1	0.6	2	1.3
Abscess, soft parts	4	2.5	4	2.5
Paronychia	5	3.1	5	3.2
Bronchopneumonia	1	0.6	..	...
Total cases treated	163		158	

TABLE V

Serum Treatment of Scarlet Fever

Number of Complications per Case by Kind of Serum Used

Kind of Serum		Number of Complications per Case					Complications Group			Entire Group	
		1	2	3	4	5	No. of Cases	No. Compl.	Compl. per Case	No. of Cases	Compl. per Case
C	No.	54	29	10			93	142	1.5	163	0.87
	Per cent	58.1	31.2	10.7							
A	No.	50	33	5	1	1	90	140	1.6	158	0.88
	Per cent	55.5	36.7	5.5	1.1	1.1					

tions an individual contracted with relation to the type of serum used. Here again, the differences are not striking (Table V). The frequency and proportion of cases in which one, two, or three complications occurred are practically the same. When only complicated cases are considered, each case has less than two complications, whereas the inclusion of all cases in each serum group shows less than one complication per case.

late release, if the therapeutic effect of serum lasts for an average period of 2 weeks. In Table VI the dismissal status of cases admitted to hospital during the first 6 months is shown by age, number, and proportion of late dismissals, and by type of serum used. An analysis of the table shows that in the antitoxin group a larger proportion of patients aged 1 to 4 and 5 to 9 were detained than in the convalescent serum group. The two age groups in

TABLE VI

Serum Treatment of Scarlet Fever

Dismissal Status of Cases Admitted to Hospital

Age	Total in Group		Late Dismissals		Proportion of Late Dismissals	
	C	A	C	A	C	A
Under 1 yr.	..	..	..	..	....	....
1– 4 "	31	32	14	19	45.2	59.4
5– 9 "	87	75	23	27	26.4	36.0
10–14 "	16	23	4	3	25.0	13.0
15–19 "	6	11	..	3	....	27.3
20+	20	17	2	4	10.0	23.5
Totals	160	158	43	56	26.9	35.4

Dismissal Status—Besides the serious complications which might hinder the dismissal of a patient at the end of 14 or 21 days of isolation, such minor conditions as excoriations about the nose and mouth, paronychiae, positive cultures from nose, throat, or ear from pre-admission institutional cases were also included as causes for late dismissal. Both convalescent serum and antitoxin in the dosages given could not reasonably be expected to exert much influence on such causes for

question contain the largest number of cases. In the 10 to 14 age group, which is smaller, the reverse is true. The difference would appear to be considerable, but upon testing the data statistically, no significant difference is noted (p. = .38).

COMMENT

When the therapeutic results of the first 6 months of the study are compared, there appears to be no significant difference between convalescent

serum and antitoxin in the treatment of moderately severe scarlet fever. This type of scarlet fever is one for which serum therapy has always been used at Herman Kiefer Hospital. A control group not treated with serum was not included in the series for this reason. Therefore, from this study, one cannot determine whether without serum there might have been equally good results. Furthermore, the possibility of a nonspecific serum effect was not ascertained. In order to answer these questions a third serum was introduced, on February 1, 1937, and this was used until the experiment terminated on July 31, 1937. The new serum was nonspecific for scarlet fever and contained 1,000 units of diphtheria antitoxin per therapeutic dose of 10 cc. This was furnished by the Laboratories of the State Department of Health and was from horses which had not been used previously in the production of antistreptococcic sera. The nature of the serum was unknown to the hospital medical personnel until after the termination of the study, so that in so far as is humanly possible, no bias was introduced. The 3 sera were given alternately to moderately severe scarlet fever patients as they were admitted to the Communicable Disease Service. Needless to say, the antitoxin and the convalescent serum used during this period were not measurably different from those used during the first 6 months. In the analysis which follows, "special" serum refers to the newly introduced nonspecific serum. When specific serum is mentioned, convalescent serum, antitoxin, or both, are meant.

The data collected during the second 6 months were put to test with respect to comparability of serum groups in a manner similar to that accorded the data of the first 6 months. The 3 serum groups were found to be comparable with respect to the characteristics tested except kind of serum administered.

RESULTS OF TREATMENT FOR THE 6 MONTHS, FEBRUARY 1, 1937, TO AUGUST 1, 1937

During the last 6 months of the study, 773 patients with a moderately severe type of scarlet fever were dismissed from the Communicable Disease Service. The number of cases was distributed among the 3 serum groups as follows: special serum, 252; convalescent serum, 261; antitoxin, 260. The slight discrepancy in group totals is due, as before, to elimination from each group of toxic and septic cases inadvertently classified as moderately severe on admission.

Augmented Treatment—The number of cases in each group needing additional serum following administration of the initial dose was determined (Table VII). Only 12 and 13 cases receiving convalescent serum and antitoxin respectively needed additional serum; the proportion of such cases is the same. In contrast, the special serum group shows augmented treatment administered to 74, a proportion of 29.4 per cent. When this proportion is compared with that for both convalescent serum and antitoxin, the ratio is nearly 6 to 1. Thus a marked difference is noted in the number of failures as between nonspecific and specific serum therapy. As for the earlier period, failures were eliminated from each group for the remainder of the analysis.

TABLE VII

Serum Treatment of Scarlet Fever

Number and Proportion of Cases with Augmented Treatment by Type of Serum Used

Serum	*Total Cases*	*Augmented Treatment*	*Per cent Aug. Treatment*
Special	252	74	29.4
Convalescent	261	12	4.6
Antitoxin	260	13	5.0

TABLE VIII

Serum Treatment of Scarlet Fever

Temperature Pattern of Cases by Type of Serum Used

Temperature Pattern	Number of Cases			Per cent of Total Cases		
	S	C	A	S	C	A
Normal	79	171	160	44.4	68.7	64.8
Lysis (5 days)	69	46	52	38.8	18.5	21.1
Continued fever	30	32	35	16.9	12.8	14.2
Totals	178	249	247	100.1	100.0	100.1

Temperature Pattern—This factor shows but little variation when the result of specific treatment is compared (Table VIII). There is, however, a striking decrease in the proportion of cases in which the temperature reached normal within 24 hours in the special serum group. The proportion of cases in which the temperature declined by lysis is higher than noted in the specific groups. The proportion of cases with continued fever was slightly greater in the nonspecific serum group.

Uncomplicated Cases—The number of uncomplicated cases in the group receiving special antitoxin was 66 (Table IX). There were 119 uncomplicated cases in each of the convalescent serum and antitoxin groups. The proportions for the various groups were respectively 37.1, 47.8, and 48.2. It is readily apparent that no difference appears in the proportion of uncomplicated cases in the convalescent and antitoxin groups. The special group again suffers by comparison, and the difference is almost significant (p. = .03).

TABLE IX

Serum Treatment of Scarlet Fever

Uncomplicated Cases by Type of Serum Used

Serum	Total Cases	Uncomplicated Cases	Per cent Uncomplicated
Special	178	66	37.1
Convalescent	249	119	47.8
Antitoxin	247	119	48.2

Occurrence of Complications—The complications are listed in Table X. When the incidence of the 3 common complications of scarlet fever is compared with respect to the three sera tested, one notes as striking a similarity

TABLE X

Serum Treatment of Scariet Fever

Occurrence of Complications by Type of Serum Used

Complications	Special		Convalescent		Antitoxin	
	No.	Per cent	No.	Per cent	No.	Per cent
Otitis media, cat.	6	3.4	10	4.0	11	4.5
Otitis media, supp.	20	11.2	13	5.2	15	6.1
Mastoiditis	4	2.2	..	...	3	1.2
Ethmoiditis	..	...	1	0.4	..	...
Rhinitis	88	49.4	95	38.2	86	34.8
Angina, post-scarlatinal	1	0.6	3	1.2	1	0.4
Cerv. adenitis, non-supp.	50	28.1	53	21.3	42	17.0
Cerv. adenitis, supp.	..	....	1	0.4	..	....
Abscess, peritons	..	....	..	...	1	0.4
Nephritis	2	1.1	3	1.2	3	1.2
Bacteremia	1	0.6	..	...	..	...
Abscess, soft parts	2	1.1	4	1.6	5	2.0
Paronychia	3	1.7	7	2.8	9	3.6
Scarlet fever, recurrent	..	...	..	...	1	0.4
Total cases treated	178		249		247	

TABLE XI

Serum Treatment of Scarlet Fever

Number of Complications per Case by Kind of Serum Used

Kind of Serum		Number of Complications per Case				Complications Group			Entire Group	
		1	2	3	4	No. of Cases	No. Compl.	Compl. per Case	No. of Cases	Compl. per Case
S	No.	59	42	8	3	112	179	1.6	178	1.0
	Per cent	52.6	37.5	7.2	2.7					
C	No.	85	33	10	2	130	189	1.5	249	0.76
	Per cent	65.4	25.4	7.7	1.5					
A	No.	88	31	6	3	128	180	1.4	247	0.72
	Per cent	68.7	24.2	4.7	2.3					

in the incidence rates of these complications for the convalescent and antitoxin-treated groups as was encountered during the first 6 months. Cases receiving special serum show a moderately higher rate for cervical adenitis and rhinitis, and a proportion twice as high for suppurative otitis media. The incidence of the remaining complications listed in the table is too small to warrant consideration.

Proportion of Cases with Multiple Complications—The number of complications per person in the specific serum groups show little variation (Table XI). A smaller proportion of cases receiving nonspecific serum developed but one complication. However, the proportion of cases having two complications was greater for this group. Taken in the aggregate, there is little difference between the serum groups with respect to the number of complications per complicated case. When all cases in the respective groups are used as the basis for comparison, then the special group shows an average of one complication per case while the specific serum groups show less than one.

Dismissal Status—The remarks previously made with respect to the questionable value of serum on the dismissal status applies equally well to an analysis of the last 6 months' experience. The results previously noted are borne out in Table XII, for although the proportion of late dismissals is higher in the group which received special serum, yet the difference between this group and those receiving specific serum is of slight consequence. The difference between the convalescent serum group and the antitoxin group is practically nil. It will be recalled that on cursory analysis of the first 6 months' experience there appeared to be a real difference in the

TABLE XII

Serum Treatment of Scarlet Fever

Dismissal Status of Cases Admitted to Hospital

Age	Total in Group			Late Dismissals			Proportion of Late Dismissals		
	S	C	A	S	C	A	S	C	A
Under 1 yr.	..	1	..	..	1	..	....	....	....
1- 4 "	39	56	57	20	24	25	51.3	42.9	43.9
5- 9 "	82	96	116	17	17	19	20.7	17.7	16.4
10-14 "	36	58	48	5	6	4	13.9	10.3	6.2
15-19 "	8	11	6	..	1	3	....	....	50.0
20+	13	27	20	3	3	2	23.1	9.1	10.0
Totals	178	249	247	45	52	53	25.3	20.9	21.5

proportion of late dismissals between the convalescent serum group and the antitoxin group, but this was not borne out by test. Thus, the second 6 months' experience is in keeping with that of the first 6 months.

COMMENT

During the last half of the study, 3 sera were used; 1 was nonspecific, and 2 were specific. For all factors tested, specific sera showed better results than did the nonspecific serum. Furthermore, the results obtained with specific serum bear out the experience noted during the first 6 months, namely, that no real difference was demonstrated with respect to their therapeutic value under the conditions of the study. It would appear then that on the basis of the year's study, convalescent serum and scarlet fever antitoxin proved equally effective in the treatment of moderately severe scarlet fever.

It is interesting to conjecture the reason for the similarity in therapeutic effect exhibited by convalescent serum and antitoxin in the doses administered. Several possibilities come to mind. Because this experience covers a single epidemic cycle, one might object that the test period is too short, and that for this reason no real benefit has been demonstrated. The test period might well be extended, but the objection would appear to be less pertinent when the therapeutic result obtained with nonspecific serum is contrasted with that obtained when specific sera were used. The differences in some instances are striking and all are in the same direction, namely, in favor of specific sera. This reason does not appear to be tenable.

A second possibility is the presence in both sera of an antibody other than an antitoxin or an antibacterial substance to which their similar therapeutic effect might be attributed. This is not likely.

A third possibility is that scarlet fever is at present rather mild in Detroit as it is generally in the United States, and that use of either convalescent serum or antitoxin in the dosage used is sufficient to give satisfactory results. This might be interpreted in one of two ways: First, the antitoxin content of both sera is solely responsible for the therapeutic effect obtained. A few workers, particularly Rhoads and Gasul,[1] have implied, if not definitely stated, that the therapeutic value of any scarlet fever serum was entirely dependent upon its antitoxin content. It does not seem plausible that two sera, the ratio of whose antitoxin content is of the order of 100 to 1, should show the same therapeutic results when tested under control conditions. It must be borne in mind that the cases treated in this study were all of the moderately severe type of scarlet fever; all had temperatures ranging between 102° and 105° upon admission to hospital, and all other factors tested were similar. It seems unlikely that the antitoxin content alone determined for both sera the therapeutic results obtained. If this were the case, it would be equivalent to stating that equally good results would be obtained if a therapeutic dose of antitoxin consisting of not more than 60 units were used instead of one containing 6,000 units, the dosage used in this study. This does not appear to be very likely. Second, the therapeutic result demonstrated by antitoxin is due to its high antitoxin content, and a similar result in the case of convalescent serum is due to the presence of antibacterial substances, augmented slightly perhaps by the small amount of antitoxin to be found in this type of serum. This seems the most likely explanation.

SUMMARY AND CONCLUSIONS

The therapeutic effect of scarlet fever convalescent serum, scarlet fever anti-

toxin, and a nonspecific serum was studied during one year beginning August 1, 1936, and ending July 31, 1937. During this time, 995 moderately severe scarlet fever patients were admitted to hospital, and there received a single dose of one of the sera by the intramuscular route. The study was controlled by alternation in administration of sera. No statistical difference was demonstrated between the serum groups when certain status-on-admission factors were tested. From the therapeutic results obtained in this study, the following conclusions are drawn:

1. Convalescent serum and antitoxin in the dosage given and route utilized appear to exert a similar therapeutic effect with respect to the factors studied.

2. The value a scarlatinal serum exhibits in the treatment of moderately severe scarlet fever does not appear to be gauged entirely by its antitoxin content.

3. If there is value in using nonspecific serum in the treatment of moderately severe scarlet fever, then there is greater value in using specific serum, namely, convalescent scarlet fever serum or scarlet fever antitoxin.

NOTE: The authors wish to express their appreciation to Dr. C. C. Young and Dr. W. A. Bunney for their assistance in the preparation of the scarlet fever antitoxin and the diphtheria antitoxin used in this study.

REFERENCE

1. Rhoads, Paul S., and Gasul, Benjamin M. Convalescent Scarlet Fever Serum and Commercial Antitoxin. *J.A.M.A.*, 102:2005 (June 16), 1934.

Forerunners of Modern Preventive Medicine

THE foundations of the administrative practice of modern preventive medicine are to be seen in the work of the practitioners of medicine in the eighteenth century. The work of Mead has been instanced in this connection, and he was the forerunner of others.

Heberden and Huxham studied fevers; Fothergill described malignant sore throat; Smellie and William Hunter practised and advanced the art of obstetrics; and Charles White applied antiseptic principles to it; Haygarth of Chester introduced notification and isolation of infectious disease; Richard Bradley studied plague at Marseilles; Sir John Pringle began hygienic reform in the British Army; Lind laid down principles for the abolition of scurvy among seamen and the prevention of typhus fever; Sir George Baker wrote on the cause of Devonshire colic and palsy; Sir Gilbert Blane studied the diseases of the Navy; Percival denounced the lack of hygiene in crowded factory towns and initiated "industrial welfare"; and Edward Jenner introduced vaccination for smallpox in place of the inoculation method practised for seventy years before.

Thus, much research work had been and was being done in fields where the safety of the community and the interest of the practitioner coincided. Walter Elliot, Minister of Health, Health and The State, *Brit.M.J.* Feb. 25, 1939.

Social Security Needs for Vital Statistics Records*

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THE administration of the social security program involves the collection of a large volume of vital and economic data pertaining to persons covered by the old-age insurance, the unemployment compensation, and the old-age assistance provisions of the Social Security Act. The present discussion is concerned particularly with the significance and relationship of vital statistics records to the data arising out of the administrative operations of the Bureau of Old-Age Insurance.

It was originally estimated that there would be approximately 26 million persons whose wages would be taxable under Title VIII of the Act. As a matter of fact there are now more than 41 million persons with account numbers, with about 32 million persons already accumulating wage credits.

STATISTICAL ITEMS IN INSURANCE CLAIM RECORDS

The applications for account numbers furnish certain essential data regarding the applicant, including his name, residence, age at last birthday, date of birth (subject to later verification), place of birth, sex, color, date of first employment in a taxable occupation after November 24, 1936, father's name and mother's maiden name.

Since the amount of the old-age benefit is determined on the basis of the taxable wages earned since January 1, 1937, an informational report based on the employer's tax return is required. This provides additional economic information, including the period of employment, the employer's name and account number, the total taxable wages earned by the employee, and the state in which such wages were paid. For each registered employee there has been established a wage ledger sheet with a record of wages earned during each half of the year 1937. These wages can be tabulated for each half of that year and for each quarter of the year 1938 and (if quarterly reporting continues) thereafter. Under the present provisions of the Social Security Act, monthly benefits will not become payable until January 1, 1942.

During the first 5 years of the old-age insurance program, lump sum settlements of claims are payable for each covered wage earner who dies or who attains age 65. To date there have been 213,137 claims filed, of which 117,852 were death and 95,285 were

* Read before the Vital Statistics Section of the American Public Health Association at the Sixty-seventh Annual Meeting in Kansas City, Mo., October 25, 1938.

age-65 attainment cases. The amount payable in each case is 3½ per cent of the total taxable wages earned by the employee since January 1, 1937. The number of claims will increase as time goes on, the ultimate limit being the actual number of deaths plus the age-65 attainments among covered wage earners.

In the development and adjudication of these claims many items of statistical information are obtained, some of which have not hitherto been available from so satisfactory a source, for so large a number of persons, or with so high a degree of accuracy. This body of information includes the following:

A. All Claims
   1. Employee's account number
   2. Type of claim (life or age-65 attainment)
   3. Origin of claim (state and field office)
   4. Domicile of wage earner at time of filing application or at time of death
   5. Sex
   6. Color or race
   7. Occupation
   8. Total wages upon which amount of claim is based
   9. Amount of claim
   10. Place of birth
   11. Date of birth
   12. Number of different employers (since January 1, 1937)

B. Death Claims
   1. Age at death
   2. Place of death
   3. Date of death
   4. Marital status of wage earner at time of claim
   5. Age of spouse
   6. Number of children, by age
   7. Number and relationship of payees to wage earner
   8. Amount of expenses in last illness
   9. Amount of funeral expenses

C. Age-65 Attainments
   1. Type of evidence required to establish date of birth on life claims
   2. Date of attainment of age 65

Both life and death claims are of interest from the standpoint of vital statistics.

The characteristics of our 41 million potential claimants have been determined from a 10 per cent sample. This population is, of course, dynamic. Additions to this registered population are being made constantly as young persons enter the labor market and as workers formerly in non-covered occupations shift to covered employments. Subtractions from the registered population occur from two causes only, death and attainment of age 65. It must be pointed out that the shifting of an employee from covered to non-covered employment does not change his status as a potential claimant nor subtract him from the total registered population. Such an employee may, at any later time prior to death or attainment of age 65, return to covered employment and subsequently qualify as a claimant.

In estimating the expected subtractions from our registered population use must be made of the mortality statistics and of the life tables of the U. S. Bureau of the Census. Thus the Social Security program has, and will continue to have, pressing need of vital statistics records.

May we depart for a moment from consideration of the record forms and the statistical data involved in the administration of the system which is now in operation. You will be interested in some contemplated changes in the present system which are being actively explored and which, if adopted, would have substantial implications for statistical problems of coming years. As many of you know, the President has suggested to the Social Security Board that it examine the possibility of liberalizing the old-age insurance benefits. He has specifically raised questions concerning the possibility of providing benefits not only for those insured workers who attain old age, but also for aged wives and widows and for young children of persons dying before reaching retirement age. The Social Security Board is studying the possi-

bility of such liberalization of the old-age insurance benefits, and in addition, is exploring the possibility of providing benefits for workers who become permanently and totally disabled before attaining retirement age.

It is, of course, too soon to say what the results of these studies will be. We would at this time only call to your attention that if any or all of these contemplated new benefits should become part of the social insurance system, the vital statistics needs will be considerably expanded. For example, records concerning marital status and family relationships will become important. Many types of claims will involve statistical records concerning the relationship of parent to child, and there will be need to know the age of a child who might be eligible to dependent children's benefits. Accordingly, the administration of the system may become as actively concerned with birth records as with death records—birth records being important in establishing not only parent-child relationship, but also the age of a child. It may, therefore, become desirable or necessary not only that the death certificate should carry an account number, but also that the birth certificate should carry the account number of either parent or of both parents. Obviously the problems involved in making birth certificates useful for Social Security purposes are closely related to problems we now are facing in respect to death certificates.

THE RÔLE OF BIRTH CERTIFICATES IN OLD-AGE INSURANCE ADMINISTRATION

For administrative reasons, it is necessary in the case of life claims to establish the exact age of the wage earner, and in the case of death claims to establish the fact and date of death. Owing to the comparatively recent development of birth registration in the United States, most persons who become 65 years of age during the period 1937–1942 will be unable to obtain birth certificates. Moreover, since the claims are for small amounts during the early years of the old-age insurance program, the Social Security Board has been disinclined to impose any expense upon the claimants, either for certified copies of birth or death certificates, for notary fees, or for other purposes.

However, as the program progresses, and especially when monthly benefits become payable, it will be necessary to simplify the procedure for establishing proof of age. The ideal proof of age is a birth certificate filed under the regularly established birth registration machinery. As time goes on, more and more of the wage earners will be able to obtain such certificates filed at the time of birth, or within the period for delayed registrations permitted by the respective state registration laws.

The problem of delayed registration has been given special consideration during recent years, formerly by a committee of the Vital Statistics Section under the chairmanship of Dr. Stewart Thompson, and now by a committee of the American Association of State Registration Executives, under the chairmanship of Dr. Martin B. Woodward. The Social Security Board will follow with interest the work of this committee. It is recognized that any legislation permitting registration of births long after their occurrence must be carefully safeguarded against fraud and inaccuracy. Nevertheless, if some solution satisfactory to the state registrars could be devised for this problem, we would be able to rely upon the birth certificate as a suitable proof of age. Lacking such a solution, and until the time when all wage earners will have been born subsequent to the establishment of effective birth registration, we must rely upon other methods of proving age. In the meantime, every appropriate effort should be made

to strengthen the existing system of birth registration.

But proof of age is not the only purpose which can be served by the birth certificate. If dependent children's benefits were provided, proof of relationship would be also served. In addition, information on the social and economic status of our covered wage earners would be helpful in administration and in providing the statistical basis for revisions in the Act which may have to be made from time to time.

As a background for these and other studies it is necessary to give special attention to the standardization of statistical classifications as to special items of information. Let us digress at this point from consideration of birth certificates to illustrate the problem. Among the items which require special classification codes, we might mention occupation and industry. Several attempts have been made to harmonize the occupational classifications now being used by different branches of the federal government, such as the Bureau of the Census, the Works Progress Administration, the Bureau of Labor Statistics, and the Social Security Board.

The Social Security Board is cooperating with the Central Statistical Board and the American Statistical Association in developing an occupational code which can yield comparable results when applied to occupational information obtained from employers, from birth and death certificates, from U. S. Employment Service records, or from population census schedules. The occupation of each old-age insurance claimant is furnished on the employers' report form, and tests have established that this is a satisfactory source of such information. It is hoped to ascertain from the same source the occupation of nearly all holders of Social Security Account Numbers. The availability of occupational data concerning so many wage earners from such a reliable source is most reassuring to statisticians interested in the study of occupational variations in mortality and in studies of births by social and economic status of the parents. This new opportunity to develop useful statistics by relating the existing birth and death information to the wage records and claims data of the Social Security Board justifies us in looking forward to the development in the United States of a new basis for fruitful study of mortality, fertility, and other population problems.

THE RÔLE OF DEATH CERTIFICATES IN OLD-AGE INSURANCE ADMINISTRATION

The death certificate has an even greater significance to old-age insurance administration. As noted, it is necessary during these first 5 years to have prompt notification, with proof, of the fact and date of death. A certified copy of the death certificate would be desirable for both administrative and statistical purposes but for the fact that we must have proof of death before the monthly reports of the local registrars will have reached the state registrars. Even in these early years of the old-age insurance program, when claims are for relatively small amounts, 56 per cent of the applications are filed within 45 days. Nearly half of these, or 25 per cent of the total, are filed within 15 days. Promptness of reporting may be expected to be even more striking as the size of claim increases. Unless we devise some method of obtaining notification and proof within less than 10 days after the fact of death, our field agents will frequently be obliged to obtain information direct from local registrars.

In order to avoid both the annoyance of these officials and the numerous searches in their confidential files which would be necessary, it is proposed to have a special death certificate printed by the Social Security

Board and distributed to the local registrars through the existing registration machinery. This certificate would be filled out at the time of issuing the burial permit and mailed direct to the Bureau of Old-Age Insurance.

This special certificate will not carry all the items required on the Standard Certificate of Death. It will not include, for example, any of the items which relate to cause of death. Such information can be more reliably obtained for statistical purposes from the Division of Vital Statistics in the Bureau of the Census, where the cause is coded according to the *International List of Causes of Death*, complete data being obtained if necessary by querying directly to the attending physician.

This special certificate will, however, include the name, sex, race, age at death, place and date of death, and such other identifying personal particulars as are necessary or helpful to the development and adjudication of old-age insurance claims. After monthly benefits become payable in 1942 (or before then if the Act is amended), such a certificate will enable the board to determine promptly when payments should cease or when they should be made payable to beneficiaries covered by the Social Security Act instead of to the deceased wage earners. Without some very prompt means of ascertaining the fact of death much trouble and expense may be involved in recoveries from their estates of overpayments or incorrect payments to beneficiaries.

The procedure proposed for obtaining the special death certificates is to have them printed by the Social Security Board, bound in pads, and distributed to the local registrars through the state registrars' offices, along with the regular supplies of state certificate blanks. The Social Security certificates will be in duplicate, printed on colored paper. The local registrar will execute the forms in duplicate at the time of issuing the burial permit, being asked to take special pains to insure that the Social Security Account Number is copied correctly. The original of the special certificate will be mailed at once to the Social Security Board in an official return envelope, a supply of which will have been received with the blank forms. The duplicate will be attached to the original state certificate and forwarded to the state registrar with the routine monthly report required by local regulations.

In the state office, the duplicate copy of the Social Security Board certificate will be checked and forwarded to the U. S. Bureau of the Census with the regular shipment of transcripts. In the processing of the transcripts in the Bureau of the Census, the cause-of-death code will be entered on the Social Security Board duplicate and forwarded to the Bureau of Old-Age Insurance. Thus, the original copy having been mailed direct by the local registrar, will accomplish the purpose of establishing, for Old-Age Insurance purposes, prompt notification of the fact and date of death; and the duplicate copy, arriving some weeks later, will bring to us from the Division of Vital Statistics of the Bureau, the cause-of-death code which will then be punched on our claims cards.

This suggested plan and procedure has been discussed with Dr. Dunn and Dr. Collinson of the Bureau, who have generously collaborated in the development of the procedures, with members of the Vital Statistics Section Council, and with several of the state registrars with whom there has been opportunity for conference. The proposal is placed before you today for consideration and with the hope that your discussion will help us to develop a procedure which will be acceptable to all concerned. Needless to say, it is expected that the Social Security Board will arrange mutually satisfactory com-

pensation both to state and local registrars.

Other points on which we invite your comments at the session today are the inclusion of the Social Security Account Number on the death certificate and the Account Numbers of the parents on the birth certificate.

DISCUSSION

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State Board of Health, Jefferson City, Mo.

MR. Smith has very ably presented the needs of the Social Security Old-Age Insurance Division. The proposed plan for furnishing blanks in duplicate to the registrar seems to be a practical and simple solution of the problem of securing proof of death promptly. Mr. Smith's hint of compensation to the local registrar is very interesting and I trust that we will receive further information. Some additional form of remuneration to the local registrar should reduce his complaints of overwork with underpayment to a minimum and generally make the job of local registrar more interesting.

However, this is not the whole problem; Mr. Smith has suggested a much greater one. It is evident from his remarks that we have experienced only the beginning of the demand that will eventually be made for our services. It may discourage some of us to learn of the probability of increased demands in the future when those of the present are so difficult. In meeting the demands of the present the states have met the problem in various ways, some of which are: the training and supervising of one or more clerks from the state Social Security office: the requirement that all inquiries originate in the local registrar's office and, in one instance, the neglect of regular and necessary duties in the vital statistics bureau. In striving to meet these demands we have acknowledged that one of the most important duties in vital statistics is being of service to our people. It follows then that we must develop with the social legislation of today in order that we may continue to be of service.

A nation-wide social security program calls for a nation-wide system of vital statistics. The adoption of the new certificate forms will not be sufficient. We must standardize our methods as well as our forms. We must replace our present laws with a new model law. We must establish minimum standards for delayed certificates, for corrections or amendments, for adopted children's certificates, and for other procedures. We must persuade our health officers of the need for increased personnel and equipment in anticipation of what lies before us.

We are all proud of the voluntary relationship between the states and the U. S. Bureau of the Census. It is within our power to better our record and make an even greater contribution to the health and welfare of our own people and those of other states by a voluntary agreement on methods in vital statistics.

All this has been said many times in the past by those much better qualified than I, but it can be done, and it should be done, now. If we postpone action there is a possibility that we

may compel social agencies to organize their own machinery for the collection of vital statistics data independently of ours. It is only fair to point out, however, that no such attempt has been initiated by the Old-Age Insurance division of the Social Security Board.

As a newcomer in vital statistics, it seems very much in order that we hear from some of the more mature and experienced vital statisticians present.

Public Health

PUBLIC health is a comprehensive science. Many contribute to it—the engineer, the architect, the lawyer, the administrator, the sociologist, the chemist, the physicist, the physiologist, the biologist, the biochemist, and so forth. But the chief contributor is naturally the exponent of medicine. The doctor was at first faced with the problem of treating a disease, a departure from the normal. In order to recognize the disease he had to know the condition and state of the healthy body. Hence the importance of anatomy and physiology in the medical curriculum. Next he was occupied in studying the causes of disease: *Felix qui potuit rerum cognoscere causas.* Thence it was a short step to study how these causes might be prevented from assailing the human healthy body—in other words, preventive medicine. Walter Elliot, Minister of Health, Health and the State. *Brit.M.J.* Feb. 26, 1939.

Potentialities of Public Health Engineering in Relation to the Social Security Act*

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PUBLIC health work under the Social Security Act is essentially a new program. The Act was passed in 1935 and funds became available about 2½ years ago. It is, therefore, too early to estimate its actual value on the basis of experience. This legislation and the regulations under which it is administered obviously contemplate a long-range program, and one of increasing influence. Remarkable progress has already been attained. The most significant accomplishment of this program has been the formulation and wide acceptance of fundamental administrative policies which should serve as the foundation for greater achievements.

A discussion of the encouraging possibilities afforded by a new program is attended by certain dangers two of which may be mentioned. Undue optimism, incited by favorable reports may lead to overdevelopment of the immediate expectations of those concerned. An enthusiasm which is based on "wishful thinking" rather than careful analysis may not be sustained by later experience and ultimately may contribute to a decline in morale when inspiration for continued effort is needed. On the other hand, there is danger that a discussion of potentialities may be too realistic and confined only to immediate and superficial values. The men who have developed this program, while practical, have been idealistic in the truest sense, dealing in fundamental principles and visualizing the developments of the future. The administrative policies of the program are not limited by present practice. They can, and undoubtedly will, be readjusted so as to utilize advances in knowledge and improvements in procedure.

The writer has no inclination to "overstate the case" of public health engineering in relation to the Social Security Act or to arouse an unwarranted degree of optimism. The total annual appropriation to the U. S. Public Health Service for all purposes in this program is relatively small—about 8 cents per capita. Obviously the immediate development of adequate public health engineering facilities to serve all areas in the country cannot be expected. The outlook of public health engineering in the Social Security Program is indicated by encouragement of the scientific approach to public health problems

* Read before the Public Health Engineering Section of the American Public Health Association at the Sixty-seventh Annual Meeting in Kansas City, Mo., October 26, 1938.

through professional education and research; and by the recognition of environmental sanitation as an essential part of public health programs—federal, state, and local. In this paper I wish to emphasize some unparalleled opportunities afforded by this program to extend and improve our methods in public health engineering and to develop environmental hygiene in its broader aspects.

FUNDAMENTAL ASPECTS

There is need for a more unified point of view concerning the rôle of the engineer in public health work. Public health engineering is a recent development and it has not yet outgrown the fact that it had its origin in two different fields of activity; namely, sanitary engineering and sanitary inspection. From the standpoint of time and service rendered neither of these was primarily public health. Sanitary engineering is concerned especially with design, construction, and operation. Although important benefits to public health are provided by sanitary engineering, a sanitary engineer, engaged in the design and construction of a water works system, a sewage treatment plant, or a garbage incinerator, devotes more attention to materials of construction, hydraulics and heat losses than to morbidity rates, sources and modes of infection and physiological responses of human beings to their environment.

Sanitary inspection was the forerunner of municipal and rural public health engineering. This activity was intended to reduce environmental health hazards but it has been, and frequently is, unscientific as a public health procedure. For example, a recent survey of the sanitation program in a city with an excellent health department shows that, exclusive of milk and food control, 34 per cent of the accomplishments recorded as sanitation were abatements of nuisances pertaining to refuse, garbage, and trash. Many of the earlier programs of sanitary inspection consisted almost entirely of routine law enforcement and the abatement of minor nuisances which had no direct relation to public health.

Public health engineering is more comprehensive and, in reality, includes the public health aspects of both sanitary inspection and sanitary engineering. The dominant characteristic of public health engineering is that its chief concern is with public health activities. The prestige and potentialities of public health engineering as a professional entity are based upon the close relation of environment to human health, and upon the further fact that adjustment of the environment involves the application of engineering principles. This axiomatic and oft-repeated basis of this field was well described by Holmquist and Dappert about a year ago in a discussion of the "Expanding Scope of Engineering in State Health Departments."[1] They stated:

> Public health work deals with the application of science to the problems of man's relation to his environment. The task of the public health engineer is to assure necessary favorable conditions and to prevent or minimize the unfavorable. The air we breathe, the water we drink, the food we eat, the light by which we see, the people with whom we come in contact—in fact, any of the conditions of competitive life under which we live—are all a part of our environment. And just as long and broad as you can conceive environment to be, just that long and broad is the field of public health.

Public health engineering is a composite specialty of the engineering profession. It is related to, but does not embrace, many other phases of engineering; it does embrace a number of functions which have not been generally recognized as engineering. It is based upon the same fundamental sciences as other branches of engineering—chemistry, biology, mathematics, mechanics,

and physics. The essential difference is that while its basis is engineering, its primary objectives, and therefore its principal criteria of efficiency and economy, are valued in terms of human health. For example, a sanitary engineer may construct a water purification plant which is a marvel of engineering efficiency and economy. But unless it increases the degree of protection against ill-health or tends to promote better health among people it is a failure as a public health engineering project. On the other hand, a worker who uses his knowledge of engineering effectively in a program of education against environmental health hazards renders a valuable service. Many activities such as rural sanitation, school sanitation, or the routine inspection of food and milk supplies, may appear commonplace and non-technical. However, a background of technical knowledge and an engineering point of view are necessary for the solution of such environmental problems. Moreover, this provides community-wide protection of value just as in the supervision of the larger sanitary engineering utilities, as public water supplies and sewage disposal systems.

Probably much of the confusion and duplication of effort in environmental sanitation activities are caused by failure to comprehend fully and accept the expanded rôle of engineering in public health work. Engineering schools have been disregardful of this development; some health officers fail to appreciate it; and the perspective of many engineers now engaged in public health work is too restricted by traditional concepts of what engineering does or does not include.

ESSENTIAL BASES OF ADVANCEMENT

The Social Security Act demands the establishment and maintenance of "adequate public health services." This is a challenge which necessitates continued study and analysis of the fundamental requirements in public health engineering.

The late George W. Fuller, consulting engineer and past president of the American Public Health Association, was active in helping to define the field of the sanitary or public health engineer. In a paper [2] read at a general session of the 1925 meeting in St. Louis, he stressed the importance of education, applied research, and sound administration as means of bettering the performance of workers in this field. Three years ago Hyde contributed a careful analysis of the functions and opportunities of the engineer in public health work.[3] Abel Wolman has repeatedly urged further expansion of public health engineering practice into unexplored fields [4, 5]; and he has directed attention to the importance of coördination of levels of health services—federal, state, and local.[6] Other thoughtful leaders in public health believe that a comprehensive reëxamination of the causal relationships and practical values in environmental sanitation is most promising as a guide to effective planning and administration.

This brief review of basic considerations suggests five major objectives for further advancement of public health engineering as a result of the Social Security Program:

1. An effective program of education concerning environmental sanitation which will make use of factual knowledge of public health engineering and effectively utilize educational facilities in health departments to reach the general public as well as special groups.

2. Professional education of public health engineering personnel through postgraduate courses in universities and by supervised field experience; and adequate instruction in the fundamentals of public health as a part of the undergraduate curricula of engineering schools.

3. A comprehensive program of research, both fundamental and practical, including studies of the relationship of environmental factors to human health, the administration

of state and local programs of sanitation and engineering methods in public health.

4. Organization and direction of federal, state, and local activities in environmental sanitation, in a manner which will unify the program, provide supervision and effective planning, use the qualifications of engineering personnel efficiently, and avoid unnecessary duplication of effort.

5. To develop and improve public health engineering procedures so as to increase their effectiveness and be conducive to further extensions of environmental control that may be justified on the basis of present or future knowledge.

The Social Security Act specifically provides for the attainment of these objectives. Its administration has emphasized special activities in health education, professional education of personnel, coördination of research with practice, and expansion of the scope of environmental sanitation. Large increases in the number of public health engineers and sanitation assistants have already been made. Public health engineering activities have been greatly extended and the ground-work has been laid for a coördinated approach to the more difficult aspects of environmental hygiene. Further progress appears to depend primarily upon the perspective, the initiative and the skill of those engaged in this field.

HEALTH EDUCATION

Popular health instruction in the fundamentals of sanitation is essential to advancement. Past experience has demonstrated that it is possible to interpret scientific facts and present them to the public in a manner which will elicit interest and coöperation. But to be effective such an effort must be well organized and specific. Specialists in health education have been made more generally available in states and in the larger local health departments. Their assistance can also be of great value in disseminating available knowledge concerning public health engineering practices.

The methods and materials used must be well adapted to obtain the interest of important groups such as municipal officials, industrial officials, property owners, engineers, architects, plumbers, equipment dealers, and a variety of organizations. Of particular interest are more recent efforts to expand health education by instruction in public schools. Teachers are better prepared to teach public health to children; they are prepared to utilize information provided by public health engineers and sub-professional personnel in sanitation related to the local school and community. A common weakness of public health engineering in the past has been failure to make known to others the full extent of its problems and accomplishments. With more adequate personnel and assistance general health education should be an increasingly productive field in this phase of technical service.

PROFESSIONAL EDUCATION OF ENGINEERS

From the standpoint of the future development of public health engineering the most important result of the Social Security Program is increased recognition of the necessity for professional education of public health workers. Guiding principles for the postgraduate instruction of public health engineers recommended by this Association are being followed quite closely in several universities.[7] The educational facilities which are now available and progress in the education of public health engineers, sanitarians, and sanitarian assistants (sanitary inspectors) are to be discussed in a later paper on this program. It now seems probable that public health engineering will be developed as a well defined specialty of the engineering profession and that more adequate facilities for graduate study leading to degrees in this field will be provided.

The influence which the Social Se-

curity program may have upon the integration of public health instruction in undergraduate engineering courses is problematical but encouraging. The practice of engineering in almost any field has manifold public health aspects. An understanding by all engineers of the many conditions of environment which have an influence upon health and cooperation with official health agencies will be more and more necessary. Also, it seems apparent that an increasing number of engineering graduates will decide to specialize in public health engineering. An introduction to public health with emphasis upon its engineering aspects and fundamental courses in the biological and social sciences for all engineering students prior to graduation are particularly desirable. This should be considered as basic instruction and not be placed in the same category as the optional programs of study now offered by about 25 engineering schools for students who elect courses in sanitary or public health engineering.

The potentialities of such a development are impressive. It would tend to make engineers more conscious of public health problems in their own work and more coöperative with public health engineering activities. Then too, engineering graduates would be better able to decide whether they should specialize in public health engineering and would more fully realize the need for postgraduate study.

RESEARCH

We are constantly reminded that much available knowledge is not applied and yet a major difficulty in attempting to extend and improve the application of public health engineering is a lack of adequate information. Success in sanitation is peculiarly dependent upon indirect methods—promotion, salesmanship, education, supervision, stimulation, and leadership. Effectively applied these methods mobilize the resources of others and multiply the efforts of the public health engineer. But recommendations of expenditures for adjustments of the environment must be supported by convincing data regarding their public health value. Public health engineering supervision implies approval of particular methods of environmental control. This requires factual knowledge that the prescribed methods will be effective. Professional leadership must be based upon demonstrated needs and sound proposals for improvement. The necessary fund of fundamental and practical knowledge can be maintained only by a well planned program of research.

The biological, epidemiological, and administrative phases of major engineering problems need to be studied concurrently, and this should be done in coöperation with federal, state, and local health departments. Laboratory experiments and demonstrations are essential; but more extensive studies representing the conditions of actual practice also are of greatest value. Studies of this kind can be conducted advantageously in connection with established public health programs where suitable public health engineering problems and improvements are available. The flexibility and coördination which characterize the public health program under the Social Security Act will prove invaluable assets in engineering research.

The spirit of research, as expressed in a well defined program, may be made productive as shown by past experience in the improvement of water supplies, sewage disposal, milk sanitation, and other established public health engineering activities. A better understanding of such problems and the initial impetus toward their solution came largely from official health departments. But after interest was aroused, and desirable objectives had been tentatively defined, a tremendous

amount of additional study and advancement were contributed by other public, private, and commercial agencies in these fields. There are at present numerous important public health problems which appear to be closely related to environmental factors concerning which the value and methods of environmental control are not known. For example, the problems of pneumonia and other respiratory diseases, infant and child health, air pollution, and the varied aspects of housing present interesting and interrelated questions of great practical importance. Comprehensive studies and the initiation of environmental control in regard to such problems are extremely promising both as a direct approach and as a means of stimulating more widespread interest and activity.

UNITY AND COÖRDINATION OF PROGRAM

From the standpoint of administration the state is the predominant subdivision. It is important that the statewide program of sanitation should be unified to coördinate all public health engineering functions from the most technical and specialized services in state health departments to the routine performances of local units. This concept presupposes unity of responsibility for the state engineering services and for the engineering supervision of local sanitation programs. Confusion of responsibility in regard to local sanitation work can be avoided by a clear distinction between professional direction and administrative control.

The Social Security Program has accelerated the expansion of local health service and has stimulated specialized services, such as malaria control and industrial hygiene, in state and local health organizations. These services include major engineering activities requiring close coördination. In some instances these activities have been separated from other state engineering programs. However, in several states, all state and local sanitation activities have been reorganized and made a responsibility of the state division of public health engineering. This plan has the advantage of combining the direct public health engineering services of this division with the planning and professional supervision of all other sanitation activities in the entire state. The preparation and experience of the state corps of public health engineers are utilized without interference with administrative procedures which is conducive to both efficiency and economy.

Obviously, the revision of present methods of administration in the various states will be a slow process. However, the policies of the Social Security Program which demand scientific planning and adequate professional guidance should lead to more unified and stronger state and local health programs. No standard pattern of organization can be applied. There is, however, need for less attention to organization and more attention to service. Regardless of the administrative boundaries which may be shown on an organization chart, the services of public health engineers with adequate preparation and experience will be recognized as indispensable in the administration of statewide sanitation programs.

QUALIFIED PERSONNEL—AN AID TO EFFICIENT PERFORMANCE

In order that the public health engineering program may translate worthy plans into definite accomplishments, sound technics and high standards of practice are, of course, necessary. Waller [8] has aptly compared environmental sanitation to the construction of a bridge or "skyscraper." The health officer may be compared with the architect; he studies the problem and prepares a functional plan of sanitation which will meet the essential needs and

be in harmony with related conditions. The public health engineer is responsible for the details of the plan, specification of methods and materials, and direct supervision of the sub-professional workers who assist in carrying the design to completion. The usefulness and stability of an engineering structure are based first of all upon demonstrated needs, sound economics, and competent design. However, in environmental sanitation adequate qualifications of both professional and sub-professional personnel are essential to the effectiveness and stability of the program.

A high level of minimum qualifications for public health engineers and sanitation personnel has been adopted by the Governing Council of this Association. Some may think that the qualifications suggested are too high to be generally attainable, but it should be recalled that about twenty years ago the standards of quality for drinking water on interstate carriers adopted by the U. S. Treasury Department were criticised as too stringent to have general value. Although these standards now are even more exacting they are universally accepted by public health officials in this country. Nearly all public water supplies far surpass the minimum requirements, and these standards of quality are considered practicable even for private water supplies and swimming pools. The unattainable standard of today becomes the accepted minimum of tomorrow.

It would be a great mistake to set our ultimate aims for qualified personnel too low or fail to use every advantage offered by the Social Security program in this direction. Nothing is more discouraging or uneconomical than to attempt to obtain good work with incompetent workers. Hyde's study in 1935 [3] indicated that there were "probably less than 25 public health engineers regularly employed in 21 county-unit or district health departments in 10 states." As of December 31, 1937, coöperative state and federal budgets included 159 whole-time engineers employed by local county or district health departments in 21 states. Practically all of these have completed at least a short course of postgraduate instruction in public health, and an increasing number are being enrolled for a full year of graduate study in public health engineering. This indicates that in 3 years there has been more than a six-fold increase in the number of public health engineers in local health departments, exclusive of purely municipal departments; and more than double the number of states having at least one local department in which engineering supervision of sanitation has been provided. Such rapid progress in the local employment of graduate engineers and in arrangement for their professional education under the Social Security Program is merely one indication of the possibilities for the future.

Public health engineering has advanced rapidly and results have been obtained wherever responsibilities have been assumed and facilities for service provided. Effective engineering methods have been devised, more direct administrative procedures have been employed, and more competent personnel has been developed. The rapid expansion of service under the Social Security Act is coupled with a responsibility for maximum results in the use of funds to justify a continuation of the facilities which have been made available. This will result in more specific and efficient application of public health engineering knowledge and therefore in greater professional prestige and individual opportunity.

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THE opportunities of the school physician are so unique that they merit the envy of the classroom teacher in other subjects. Our teaching is done by a combination of the classroom and clinic method whereby the learner is at once the object of the demonstration and the beneficiary of the method. What could be more ideal? How much simpler the teaching of mathematics would be if, each time the student learned a new equation, he could be relieved of a distressing physical condition. How much simpler would be the English teacher's job if students consulted him with the same motives of personal concern and the same receptiveness to instruction as they have when they consult the college physician.—Charles E. Shepard, M.D., *Journal-Lancet*, Feb., 1939, p. 70.

Preparation of the Nurse of the Future*

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NO one who keeps in touch with current trends in public health can fail to see the rapidly growing tendency to accept greater if not complete responsibility for the health of the people of this nation. Assistance in influencing the economic, housing, genetic, and nutritional factors underlying health problems are among the newer activities which now engage its attention. Interest in a much greater scope of disease problems exists than even 10 years ago. So logical a part of public health does the provision of adequate medical and nursing care of those who are ill now seem, because of the consequences of its lack, that its inclusion in community health programs is rapidly becoming a major issue. Just how this will be accomplished is of course one of the most provocative social problems of the hour, but that in most communities public health administrators will be responsible for the coördination of efforts and the machinery to provide that not otherwise cared for, will be doubted only by those who believe a non-medical type of agency can more adequately administer this service. The health administrator will, if this is true, study with increasing intensity all of the factors that are involved in this care. He will conscientiously investigate all morbidity situations and, while continuing to apply this epidemiological methodology toward their prevention, will, on the other hand, survey the amount and quality of care available, what is lacking, and how it can be provided or strengthened.

If this is a true picture of the future, and our N.O.P.H.N. definition of public health nursing which designates our responsibility as that of giving nursing assistance in the whole public health program, is sound, then we shall see that the community and its health administrator are going to need and expect nursing directors and supervisors who can give them expert assistance in analyzing the total nursing picture in their community. Not just the picture of the need for and the kind and quality and production of public health nurses but of institutional and private duty and practical nurses, in order to have that community or area adequately nursed. They are going to become, or should be helped to become, intensely interested in how all of those nurses are prepared and how that preparation could be improved so that every nurse will contribute to the improvement of the health of the community.

* Read before the Public Health Nursing Section of the American Public Health Association at the Sixty-seventh Annual Meeting in Kansas City, Mo., October 25, 1938.

It would seem therefore that there will be a great need for nurses with increasingly broad understanding of the whole social and nursing situation to fill these leadership positions.

Now let us try to think what we really want of the staff nurse of the future. Two avenues of divergence from the present average nurse present themselves. One is in the direction of more automaticity, i.e., training merely in skills and technics. The other is in the direction of real education in basic principles of science and sociology which will lead to self direction and creativeness. It is easy to sympathize with the many who favor the former divergence because of the greater ease and rapidity of preparation of nurses of this type and especially since many communities at present do not appreciate the deeper aspects of having their community "well nursed." A little reflection, however, by those experienced in public health convinces them that those communities probably need the most expert nurses to understand and break down prejudices and give leadership into newer ways of thinking. And if we want a large area such as a state or the nation to be "well nursed," I submit that there is but one way of having it done and that is to have in each community or health area nurses who have a broad conception of a vital community health plan, a scientific understanding of its component parts, who are capable and interested in studying what contribution nursing can make to that plan, and who have ability to assist in leading their community into carrying the plan into action. Any nurse who has been in position to compare nurses from a state or national horizon is convinced that in every area from New York to San Francisco there is a crying need for nurses of this ability, integrity, scientific knowledge, and spirit of service.

Possibly one reason for confusion as to the trend we should take has arisen because well prepared nurses have been used to carry on functions which could be accomplished as well by those with little or no training. In the better thought-out nursing programs (both public health and institutional), this largely has been avoided by use of volunteer assistance. In the institutional field the use of a subsidiary worker such as New York State's new licensed practical nurse is an approach to that problem. It is not beyond conception that she may also be used in the community nursing service. If so, a plan should be made to have the two work hand in hand as nurse and nursing assistant. But let us make no mistake that our crying need is first for nurses who can plan and organize and nurse their area before we consider another group of paid assistants to amplify it.

Another factor of resistance to that type of nurse has been confusion of our medical associates who feel we are desirous of replacing them in medical functions. It has been my experience that the best equipped nurse is least guilty of creating that impression. She sees so much to be done in her nursing province that she runs less chance of trying to take on the medical officer's or physician's job herself.

If we really want this kind of staff nurses we must help the community to understand that the type of program suited to develop such leadership over the long range cannot always produce workers who are immediately skillful. We will have to see that potentially good material is patiently protected during this learning period in order that their ultimate contribution may be great. We must encourage this type of preparation of young women in sufficient numbers that each time we find such a promising person we shall not need to snatch her from field work for a supervisory position (often prematurely for her own good) and lose the benefit of her con-

tribution to improved field work, an inestimable loss for which the only correction I can see at present would be the return of every administrator, instructor, or supervisor to field work periodically. Incidentally I believe some new and better emphases in public health nursing would soon result.

How can such nurses be prepared? One way is to influence and assist those responsible for postgraduate courses. Fine! Do we do it? Too infrequently. When they endeavor to be more selective of their students we beg for exceptions or complain of their being too strict in their regulations, and then blame the college because all their output is not suitable material for our needs. We fail to keep in close touch with the college and tell them just what we shall expect of the nurses they educate. We have an increasing tendency to define our standards for postgraduate work in terms of procedures to be followed rather than goals to be achieved. We want a transformation in the nurse to be accomplished in a period of time too brief to give the basic underlying fundamentals. Then, too, we are very easy going employers, too unanalytical and avocal about the failures. From such reports the university could learn how to improve in the future. We do not plan generously for areas and personnel to give the field experience necessary to round out this preparation. This is particularly true of official agencies who are prone, not even to assist the nonofficial agency in so doing, saying they are too busy or too poor, and yet criticising the new appointees they accept because they do not have the health department point of view—merely a V.N.A. outlook.

But even if we corrected all these faults and were paragons of virtue as far as postgraduate education is concerned, I think there is not a public health nursing course director who would not say that still her greatest problem is finding students with a sound basic scientific education and clinical experience upon which to build. If you do not know what I mean just try to inspire and teach a group of potential public health nurses how to assist in a communicable disease, tuberculosis, or syphilis program who have never had any experience in that field. I am not sure that Mary Beard will not go down in history as the outstanding public health nurse of our times in her insistence that the place to strengthen nurses for community work of the future is in the basic nursing course, and that all nurses need this broad understanding of community health.

But what do most of us in public health do about that? Mostly stand aside and consider it out of our province. Only a very small percentage of the public health nursing group belong to the National League of Nursing Education, which membership is the logical way to help.

Fortunately the few who have belonged have been sufficiently expressive of needs that there is every evidence that nurse educators now have their ear attuned to them. They are working arduously to find better ways of attracting and selecting young women with the basic personality qualities suggested above. The colossal reconstruction of the curriculum for schools of nursing [1] published last year recommends advanced educational standards of one or two years beyond high school and suggests liberal pre-professional requisites which will add to the student's general knowledge, her maturity of thought and judgment, and her cultural development. In the professional curriculum provision is made for greatly strengthening the social, biological, and physical sciences; emphasis is placed from the very beginning upon all nursing as health conservation; upon the family as the agency for promoting health,

and the child as the most malleable recipient; upon nutrition; upon groups of illnesses (including mental) now more amenable to control; upon the teaching function of the nurse; upon her own health and the enrichment of her own living. Wherever this curriculum can be followed a new generation of nurses will surely rise to challenge us.

But, as has been ably pointed out, there are a great many handicaps to its universal application. Ruth Hay classifies them as economic and educational.[2] Outstanding among the economic problems is the fact that the school of nursing is under control of the hospital, an institution whose primary interest is service rather than education. To be sure, the hospital is necessary to a school of nursing as a practice field, but there are great disadvantages to a control that accepts unfit students in order to fill a quota, keeps questionable or frankly undesirable students because they lend an extra pair of hands and feet, maintains a school in a hospital abominably lacking in variety of clinical experience which the nurse will later meet in any normal community, skimping the school budget for fancy equipment, luxurious appointments in private rooms, or for attractive landscaping. These practices are so universal that they are almost acceptable to us in public health who could, if alert, find many opportunities to lend excellent outside assistance to the nursing school director who is a voice crying in the wilderness to her board and community for the chance to conduct a real school of nursing or discontinue it and employ a graduate staff. A second economic problem is lack of endowments or governmental subsidy such as colleges of medicine, education, or other professions enjoy, which would permit enrichment of the program within a cost not prohibitive to the average young woman.

Outstanding among the educational problems are (1) students too immature to assimilate this service, (2) resistance of the medical profession to "too much training," (3) lack of preparation of the faculty to incorporate the health point of view of which they are frequently unconscious because they have not had experience in that field, (4) scarcity of public health nurses willing and equipped to assume positions on nursing school faculties, and (5) disinterest or lack of adequate preparation of public health agencies to provide field experience for rounding out this education.

Could we as public health workers help in any of these problems? Immeasurably! In the first place, participation in the local League is indicated; a careful study of the new *Curriculum Guide* would be good preparation for a conference with the nursing school directors in our area, at which we frankly ask if there are any ways in which we can help. And if in the meantime we interpreted this enriched program to our health administrator (who should appreciate its potentialities) and motivated him to interpret and support it with other physicians in the community, it might smooth considerably the road to its adoption. We need not accept a membership on their nursing school committee which *might* result, but we can use every opportunity to interest other influential community members in these nursing education problems; possibly we could spare or help them to find an experienced and qualified public health nurse who would be interested in a faculty position, or perhaps we could arrange to assist in the teaching program on a part-time basis ourselves.

We may not be able to offer an affiliation for students in our agency, but we could plan well ordered short observation periods for each nurse or possibly allow key members of the faculty to

have a 4 or 6 weeks experience in our organization. Perhaps this could be arranged on an exchange basis, lending our superior nurses who would give as well as gain. Both groups should profit by such a plan. There is no dearth of possible ways in which we could assist in better basic preparation of the nurse of the future, but there has been a lack of assumption of responsibility in that field which I feel can no longer be condoned if we are truly interested in the nurse of the future who will or will not see that her area is well nursed.

And now a few convictions concerning the actual preparation of the public health nurse of the rather near future, a problem you and I are meeting today. One of the most important contributions we could make would be to be highly selective of the nurses we employ. We could strengthen all nurse educators if we refused to retain nurses who did not give evidence of sound integrity, sufficient cultural background to meet people in all social stations with reasonable ease, or who could not speak the English language correctly or compose an acceptable letter. Likewise, we could register our disapproval of schools lacking in strong science courses, teaching instruction, or enriched clinical experiences, by not accepting their graduates until they have strengthened these deficiencies. Alumnae members so counselled soon take this information back to their alma mater.

As I have previously stated, the burden of this responsibility for field introduction falls on the nonofficial organization—one of their great contributions in my estimation. Lest those reared in that environment get the one-sided view of public health, these organizations must turn their attention to having their faculty and supervisors persons who have experienced different types of public health nursing; official as well as nonofficial, rural as well as urban, specialized as well as generalized. Increasingly they should be persons with broad interests who are thoroughly active citizens in their own community and keenly attuned to professional problems through their participation as well as membership in professional organizations.

Not only must these nonofficial organizations see their true relationship to the community health plans—i.e., doing what the official agency is not yet prepared to undertake, but the official agency must demonstrate greater appreciation of the help of the nonofficial agency, be willing to talk over their plans frankly and discuss freely where the nonofficial agency can contribute most. They must trust that group well enough to help them work out the student or new staff introductory program, sharing as freely as possible opportunities for observation or participation within its program.

More emphasis must be placed on the goals and objectives of the organization rather than on the technics of procedure. Given a carefully selected nurse, well grounded in medical and health situations and basic principles of nursing care, take time to interest and inspire her in what can be done about them, and then challenge and encourage her to work out the best way to influence their improvement in a small area for which she is to be accountable, and one will rarely be disappointed in having a veritable dynamo of ideas and actions of a creative and coöperative nature. If she can learn that the supervisor is a sympathetic person with whom she can talk these over, who will protect the community and herself from the utterly unsafe or impossible parts of her plan but who will let her try and fail in a few from which she will learn lasting lessons; if she knows the supervisor will help her evaluate why the failure occurred and how it may be subsequently avoided, zeal and every-

day freshness in tackling even routine duties will result and a group of nurses with ability to contribute to better and easier outcomes in public health will be prepared. True, the supervisor will become less prominent as a "manager" of her district but she will experience a new and deeper satisfaction of the real teacher whose greatest aim is to produce proteges greater than herself, and incidentally she will save herself many details of administration.

A graduation and rotation of responsibilities from simple illness care through health teaching in families to teaching in groups, to making community contacts, to being responsible for keeping the whole staff well informed on trends in some certain phase of the work, to assisting in teaching students, until all has been given and gained of which the organization and nurse are capable, is a sound plan of preparation. The nurse should then be guided into seeing that her next step should be a broadening of her experience in another type of agency.

Out of such plans should grow nurses capable of developing into the supervisory or administrative positions which are to demand so much of the nurse of the future if she cares to take on this added responsibility for others. I hope, however, that many of this type of nurse are going to find the joy of the "master touch" in staff work, and with a fine preparation, a thirst for constantly reinforcing it with the new, a broad understanding sympathy with all the different organization approaches to solving the community health problem, and with a real interest in participating in professional affairs, will seek the niches where they feel they can best serve and demonstrate over long fruitful years the results of artistry and devotion in a community nursing service.

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Science

". . . We must beware of verbal lullabies that by melodious phrase and soothing rhythm sing to sleep our curiosity.

For when curiosity sleeps, science stagnates."—Alfred J. Lotka, Contact Points of Population Study with Related Branches of Science. *Proc. Am. Philosophical Society*, Feb. 15, 1939, p. 618.

Interpreting the Physician and Making Him a Part of the Health Education Program*

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PERSONAL health education endeavors so to motivate human beings that they will follow such practices, and obtain such services, that an optimum of health will result.

With the exception of a few personal practices, most information which will contribute to health must be obtained from the physician to meet individual needs. Practising physicians, by and large, are an inarticulate group, except, if I may add facetiously, in medical society meetings. They are doers, and not explainers, they say. This has come about to some extent as a hangover from the days when the practice of medicine was reckoned by many as a sort of magic which the public did not expect to understand.

With freer communication, and an enlarged vocabulary, the average person wants to know what the words so freely used by physicians and others dealing with the practice of medicine mean, before he is willing to submit to procedures for which these words are used. As an example of this, any person who comes in contact with large numbers will realize how confusing just this matter of "blood test" can be to the average person. A blood test may mean a Wassermann or a Kahn, or it may mean an estimation of the red and white blood cells, or it may mean blood taken for any number of other laboratory procedures.

Probably the idea of magic has remained attached to any procedure which has to do with the blood more persistently than to most practices in medical science. Need we be surprised then if the man in the street becomes over-responsive to the advertising of quacks which convince him that the source of his complaints can be discovered by placing a few drops of blood in an electrical contrivance? Likely he has had a leukocyte count; he may or may not have had a Wassermann or a Kahn; but in all probability some reputable physician has taken blood for some simple diagnostic procedure about which he has failed to educate the person involved. This is but one of the many instances which the everyday man experiences many, many times. A correct diagnosis of his illness may have been made as a result of the procedure, and he may have recovered from his illness, but he has learned little from it which will enable him to respect scientific services.

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There is little doubt that much of the health education of the future will have to come from the practising physician at the time he sees his patient, because preventive medicine deals more with the ways of living than with remedies. In the meantime, the established organizations which promote health education will have to find ways to provide this education. Those of us who deal with mass education ponder long and hard how specific education of this sort can be given to large numbers. The newspaper, radio, and printed matter can point the way but it requires much more than this general information to enable persons to think through their own problems and obtain what they need on one hand, and avoid becoming hypochondriacs on the other.

It is very easy to say to a community "Every child must be protected against diphtheria." It is easy again to tell the parents how this may be brought about, and the steps to be taken to ascertain whether the child has retained the protection; but if we stop here without teaching these parents, in a general way, what happens in the child's body when the preventive treatments are given to him, we have not established a trend of mind which will prevent the parent from using any number of so-called specifics which are recommended by advertisers in the printed page, and on the air. The recommendation of the promoter of cure-alls is as valid to this man as ours.

Every person here has been confronted with the confusion in the minds of average parents regarding the so-called "shots" which their children have received. Too many of these people believe that diphtheria prevention treatments protect their children against whooping cough and scarlet fever, as well as diphtheria. In our efforts to reduce diphtheria cases and deaths, have we not forgotten that most persons have little information regarding the specificity of the recommended procedures? We, and I include physicians, assume that this person knows what we are talking about when we say "diphtheria prevention," and 99 per cent of his kind do not.

An intelligent woman stopped me, after a meeting recently, to tell me how disturbed she was because a few days before she had taken her child to a pediatrician for a repeat Schick test and he told her that the test sometimes raised the blood titer. Her concern was that the physician was doing something to her child's blood, and how would it affect him in after years.

Stuart Chase, in his *Tyranny of Words*, which is a tyranny in itself, has advanced the idea that words as they are now understood separate us rather than bring us together, and I believe that this is particularly true in much of the vocabulary used by physicians and many health workers.

Advances in a democracy can be made only on a basis of education. A health dictatorship varies not one bit from a political dictatorship. The public must learn that it is their bodies and minds that are concerned, and that their happiness and security depend upon the care of their bodies. They must learn what intelligent care means, and the advantages and limitations of medical science, if they are to choose wisely. This learning will come only when we have given them an idea of body processes and medical procedures.

Health education in the early days was centered largely upon communicable diseases because they were the immediate problems of health organizations. Health education has played a large part in the control of these diseases, and these same organizations now are turning their attention to other conditions which have supplanted the communicable diseases in the list of principal causes of death.

The education required to affect the

degenerative diseases is much more difficult than the mass education which produced such good results with the communicable diseases, because it involves morbidity as well as mortality, and affects the economic life of the people, as well as their happiness. The prevention and care of the nutritional and degenerative diseases requires skill of diagnosis which involves new procedures which are costly and time consuming, and can be obtained only from a physician.

Without going into the economics of this situation about which the health educator has little to do, the responsibility for supplying education which will prevent these disabilities still is with us. An interpretation of procedures is vital and probably will be to an increasing extent as medical science advances.

Is mass education enough for this? I have doubted it for a long time. I believe we must search diligently for opportunities for personal contact—that face to face presentation which will give us an opportunity to learn what people think and how they interpret the education which we plan for them. A number of discussion groups in any community will provide this way of interpretation which will reach thousands who would not be interested in our printed matter or who never will attend meetings.

Those who lead discussion groups must be aware of the need for a common language or they will only add confusion to an already confused state.

Our printed matter, our radio talks, and our newspaper releases all need careful study in order that the many will see scientific medicine not as an abracadabra but as a reasonable procedure built upon their body needs and operation.

You will listen to discussions of technics for supplying this interpretation to the public during this meeting and these technics will be adapted to the various communities represented by those who are here because the job for the present rests with them. How can we help the physicians of our communities take on this job which so obviously belongs to them?

It is our frequent error that we plan a program and then ask physicians to promote it for *us*. We go on the assumption that we know what is good for the people and that the physician will benefit from the program as well as the persons he serves.

Somehow, all persons like to have a hand in shaping "our duty." Physicians are not exceptions to this rule, and we do "our duty" with much more relish if it is palatable and we are sold on it.

Prominent physicians in most communities are asked to assist health organizations in presenting radio material, in giving talks to groups, and in many other activities. But how about the neighborhood physician, the general practitioner, who sees the largest number of the sick and near-sick in any community? What efforts are we making to help him be a part of the health education program? Because he must be available at all hours of the day and night, he has less time to read and to attend medical conferences, and because his income is less than his specialized brethren he has less money to spend for postgraduate education.

Do we keep the general practitioner informed as to our program through frequent and carefully planned communications or do we wait for him to know about it from the newspaper, radio, or his patients?

There probably is no better investment of health education funds to be found than that intelligently planned to keep physicians informed. The personnel of the organization is expanded a hundredfold by each physician who recognizes his part in the field.

Medical societies and organizations send very tiresome and uninteresting communications to physicians whose interest they wish to obtain. The rule with these communications is that they shall be several pages in length, single spaced, with little or no margin, and that the mimeograph will be cleaned after the communication, and never before.

There is not much doubt that we talk about the subject in which we are currently interested. Physicians are not exceptions to this rule. With this in mind, can we not find places for them in our program of interpretation in order that they may learn a language that will be understood by their patients, and that they may delight in watching the appreciation of these patients when they are recognized as intelligent persons.

If we are to elicit the interest of physicians, we must keep them informed as to the problems of our community; we must ask their advice as to solving these problems, and, since written communications are the quickest way to do this, our missives must be attractive from a physical standpoint, and psychologically appealing.

There are many bits of health education which the neighborhood physician can do for small groups. In the early days of our diphtheria prevention program we sought opportunities for the dissenting or uninterested physicians to talk about it. Printed matter was mailed to them giving them the details with which they were not too familiar and they were asked to talk to small groups in churches and in schools about the need for protection against diphtheria. They came through to a man, and reports from patients that the physician did not believe in immunization ceased.

In a county in Michigan, the health officer invites one of the practising physicians of his community to take his place when he is to be out of town for a day or two. The temporary health officer learns many things about health conditions in the county during his brief period of responsibility, and his interpretation of activities becomes excellent health education for his own patients.

SUMMARY

Health education regarding procedures and practices must come from the physician at the time the patient is seen.

Medical terminology must be translated into a language which can be understood by the average man.

Physicians shirk this responsibility largely because in the past it was not expected of them.

The experience of meeting groups and answering their questions will give the physician an appreciation of the confusion found among all classes of people.

The health education activities of an organization will be effective only when local physicians have a hand in planning and helping to promote them.

Use of the Phosphatase Test in the Control of Pasteurization*

PAUL F. KRUEGER

Chief Sanitary Officer, Board of Health, Chicago, Ill.

AT the last Annual Meeting of the American Public Health Association, I reported on the use, by the Chicago Board of Health, of the phosphatase test for determining the efficiency of pasteurization of the milk and cream sold in the city. The chief cause of improperly pasteurized milk was reported to be dishonesty on the part of some of the operators of the equipment. I gave a description of the methods used in greatly reducing errors of pasteurization from this cause.

The number of samples of improperly pasteurized milk and cream which were subsequently found was very small. Investigations disclosed that the cause in the majority of these samples resulted from the use of improperly constructed pasteurization apparatus or the use of apparatus so constructed as to permit readily of improper operation, which was particularly true of the inlet and outlet valves with which the pasteurizer vats were equipped. In 88 milk pasteurization plants, 212 outlet valves and 146 inlet valves were defective when compared to the latest standards of the U. S. Public Health Service for the construction and operation of such equipment. The important requirements for plug-type leak-protector pasteurizer valves may be briefly summarized as follows:

A. All grooves shall be at least 3/16" wide and at least 3/32" deep, to prevent clogging and promote drainage.

B. All single leak grooves and all mating leak grooves when mated shall extend throughout the entire depth of the seat, so as to divert leakage occurring at all points throughout the depth of the seat, and so as to prevent air binding.

C. Washers or other parts shall not obstruct leak-protector grooves.

D. A stop shall be provided in order to guide the operator in closing the valve so that unpasteurized milk may not inadvertently be permitted to enter the outlet line or the holder, respectively. The stop shall be so designed that the plug will be "irreversible" if the plug is provided with any grooves or their equivalent unless duplicate, diametrically opposite grooves are also provided.

E. All leak-protector valves shall be installed in the proper position to insure the proper functioning of the leak-diverting device.

1. The design shall protect against leakage in every position of the plug which prevents the flow of milk, *i.e.*, every "closed position."

2. In the case of outlet valves, the design shall, in every "closed position," prevent the accumulation of unpasteurized milk in the plug channels.

F. There shall not be more than 5/64" between the "just closed" position and the functioning of the leak grooves.

G. Pipe lines between the inlet valve and holder shall be as short as practicable, and shall be sloped to drain.

H. In cases where the milk in the vat is apt to submerge the inlet pipe and thus prevent its complete emptying when the inlet valve is closed, the inlet line shall be pro-

* Read at a Joint Session of the Laboratory, Public Health Engineering, and Food and Nutrition Sections of the American Public Health Association at the Sixty-seventh Annual Meeting in Kansas City, Mo., October 28, 1938.

vided with automatic air relief located either at the valve or otherwise, and so designed as to function in every closed position of the valve.

I. Outlet valves on pasteurization holders shall be close-coupled whenever the outlet penetrates the holder below the milk level.

J. Outlet valves shall be operated so that they are fully closed during the filling, heating, and holding periods. Inlet valves shall be operated so that they are fully closed during the holding and emptying periods.

In order to prevent the possibility of improperly pasteurized milk occurring from the use of defective equipment, owners of milk plants in which valve defects were found were advised to make the necessary changes, which they readily agreed to do. In a few instances the changes were made by the individual dairymen, but in the majority the work was done by a mechanic selected by the manufacturer of the valve, and supervised by a representative of the Board of Health. The cost was exceptionally small, although much of it was done in machine shops, and the milk plant operators coöperated wholeheartedly in making the improvements, with the result that all necessary changes were completed.

The most common defect found in the valves, both inlet and outlet types

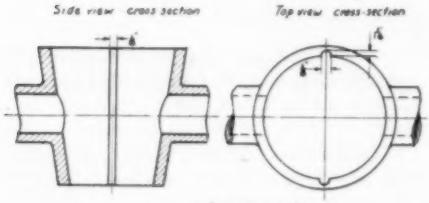


FIG. 1

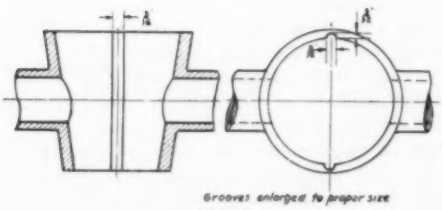


FIG. 2

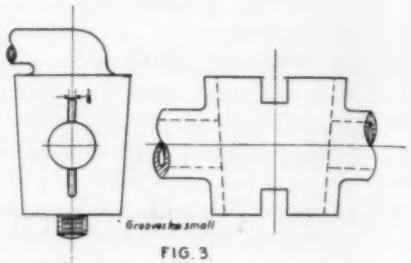


FIG. 3

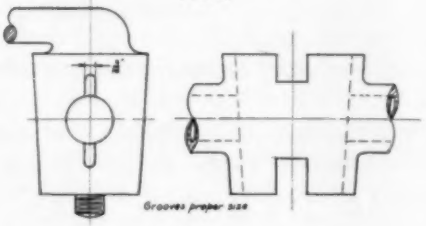
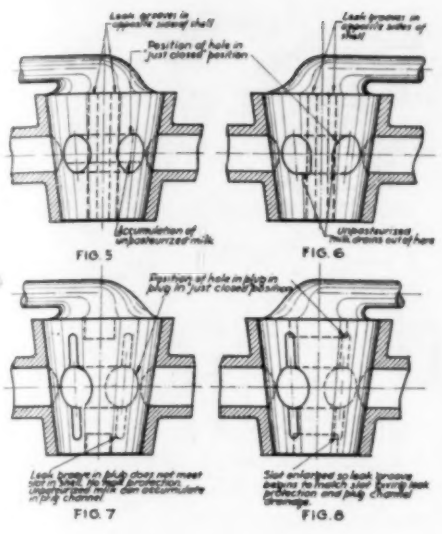


FIG. 4

and regardless of make or design, was that the grooves were too small to function properly. About one-third of these valves had the entire leak groove in the valve body. The defective grooves were corrected by putting the valve body in a shaping machine and cutting the groove to the proper size with a tool sharpened at the end to a semi-circle 3/16″ x 3/32″. (Examples of this defect and the method of correction are shown in Figures 1 and 2.) This would require about 45 minutes' work for a single valve. If these were several identical valves, the time per valve would be reduced considerably, since the machine would not have to be reset for the succeeding valves. Where the groove to be enlarged was in the valve plug, a different method was used. The plug was put in the chuck of a lathe. An electric drill was mounted on a sliding tool rest. A 3/16″ reamer was rounded at the end to form a semicircle 3/16″ x 3/32″ and put in the drill chuck. The drill on the tool rest was moved back and forth, the revolving reamer milling the groove to the proper size. (See Figures 3 and 4.) With this set-up any kind of groove in the plug could be cut or enlarged. A plug


Leak groove in opposite lower shell
Position of hole in "just closed" position
Accumulation of unpasteurized milk
FIG. 5
Leak groove in opposite lower of shell
Unpasteurized milk drains out of here
FIG. 6
Position of hole in plug in "just closed" position
Leak groove in plug does not meet slot in shell, so that protection against leak never can accumulate in plug channel
FIG. 7
Slot enlarged so leak groove begins to match slot giving leak protection and plug channel drainage
FIG. 8

with a pair of grooves, either full or partial length, could be set up in the lathe and milled to the proper size in ½ hour.

Another common defect found in inlet and outlet valves was that the valves did not prevent the accumulation of unpasteurized milk in the plug in all closed positions. In the cases where the grooves were in the valve body only, the plugs were made self-draining in all closed positions by cutting away metal from the plug to form two opposite lower corners of the hole in the plug, so that this cut-away would meet the leak-groove in the just closed position and drain the plug. (See Figures 5 and 6.) In a few cases the center of the hole in the plug would ride past the leak groove in the fully-closed position, making it necessary to cut away metal to create the additional two lower corners to make the plug drain completely in the fully-closed position. This cutting away could be done with a round file in about 20 minutes for each plug. (This is illustrated in Figures 9 and 10.)

Another common fault found was in valves which were of a type having grooves in the plug which started at the lower and upper points of the hole in the plug on each side, and extended far enough up and down the plug to meet a cut-away section of the valve body. Enlarging these grooves to the proper size also, in many cases, corrected the defect of the plug not being self-draining in all closed positions. When enlarging the grooves did not make the grooves in the plug meet the cut-away notch in the shell soon enough, it was necessary to file the notch larger. (See Figures 7 and 8.) Sometimes the groove in the plug did not extend far enough up or down to meet the notch sufficiently to allow a passage 3/16" x 3/32". In these cases the grooves were lengthened as well as deepened and widened. As a rule this type of valve was readily improved because it did not necessitate removing the valve body from the pasteurizer.

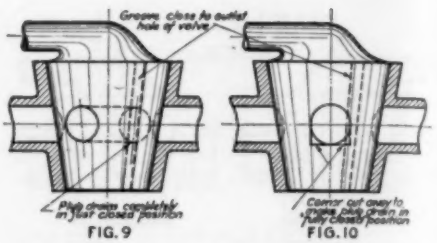
One disadvantage of this style of valve is that it has a short stop-pin in the plug and two pin-stops screwed into the shell. The stop-pin wears readily into the pin-stops, thereby shifting the "fully-closed" position over far enough so that the grooves in the plug do not match fully with the cut-away notches in the valve body. Therefore, a valve which may comply today may not comply in a short time, due to wear. The length of time, of course, for this wear to occur depends on the use the valve receives. Broken or loose pin-stops and stop-pins was a common thing.

The grooves in some valves were located in the shell in such a position that if the plug was not operated in the quadrant within the stop-pins and the plug was in the "just-closed" position, the hole in the plug would be about ¼" from the leak groove, thereby making it possible for the milk to short circuit through the hole in the plug to the outlet line. This defect was overcome by making the plug irreversible by putting another pin-stop in such a position that

if the plug were reversed it would be impossible to open the valve. (See Figures 11 and 12.)

A few irreversible outlet valves had the leak grooves located in the plugs in such a position that they were between the hole in the plug and the outlet hole in the pasteurizer in the " fully-closed " position, the mating grooves being in the valve body. This design would prevent the accumulation of unpasteurized milk in the plug when in the " fully-closed" position, as shown in Figure 13, but when in the " just-closed " position, the one leak groove lies in the opening of the pasteurizer and does not function, making it possible for unpasteurized milk to accumulate in the plug or leak into the outlet line. (This is illustrated in Figure 14.) This defect was overcome by extending the groove, which does not pass the outlet hole of the pasteurizer, the full length of the plug to the proper size, and filling the other groove with tin or brass. A new groove was cut in the shell, the distance from the outlet hole of the pasteurizer being equal to the size of the diameter of the hole in the plug, and a corner of the hole in the plug was filed away to make it self-drainage in all " closed-positions " (see Figure 15). When this same defect occurred in a reversible valve, both grooves in the plug were filled and new ones cut in the shell. Valves with four grooves in the plug and mating grooves in the shell were modified in the same manner. In the case of inlet valves it was necessary to fill both grooves in the plug because enlarging the one groove to the proper size would bring it too close to the hole in the plug and to the outlet hole to the pasteurizer. To remodel a valve which requires the filling of two grooves, cutting two new grooves, making the plug self-draining in all closed positions and installing a pin-stop and stop-pins, requires about 2½ hrs. in the shop.

Another type of valve has a hollow plug which is inserted through the bottom of the pasteurizer, with two small holes that match with two holes in the shell inside the pasteurizer and one large hole that matches with a large hole in the shell below the pasteurizer and the outlet pipe in the open position. The leak groove runs horizontally around the plug or shell between the upper two inlet holes and the lower outlet hole diverts the leakage to the lower chamber of the plug and then out of a leak hole in the shell to the


Groove close to outlet hole of valve
Plug drawn completely in just closed position
Corner cut away to make plug drain in fully closed position
FIG. 9 FIG. 10

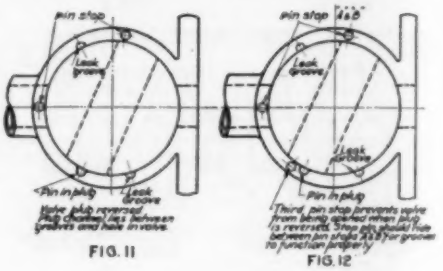


FIG. 11 FIG. 12

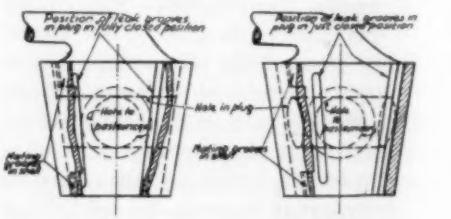


FIG. 13 FIG. 14

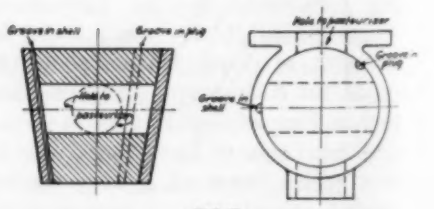


FIG. 15

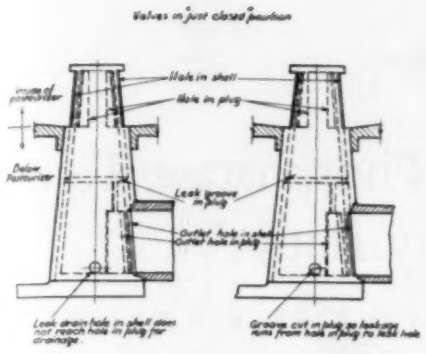

Valves in just closed position
Hole in shell
Hole in plug
Level of pasteurizer
Below Pasteurizer
Leak groove in plug
Outlet hole in shell
Outlet hole in plug
Leak drain hole in shell does not reach hole in plug for drainage.
Groove cut in plug to leakage runs from hole in plug to hole

FIG. 16 FIG. 17

floor. This leak hole was not always located in such a position as to drain the plug in all closed positions, as illustrated in Figure 16, so it was necessary to extend this hole to meet the hole in the plug in the "just-closed" position, or to file a groove in the plug. (See Figure 17.)

Another defect noted in this valve which classifies it as not completely leak-proof, was the fact that through usage the plug may be scratched or a flat side develop due to much handling. When this scratch or flat side occurs on the side of the plug that lies in the outlet of the valve in the closed position, leakage will run down this scratch or channel into the outlet line, rather than around the horizontal groove into the lower chamber and out the leak hole. These valves were made self-draining in all closed positions to prevent an accumulation of unpasteurized milk in the plug, but, in addition, the outlet pipes are required to be disconnected during the filling, heating, and holding periods. It is then steamed just before being opened.

Very few inlet valves had air vents or vacuum breakers, so, as a precaution, air-vent grooves were put in the plugs of all inlet valves on the pasteurizer side which would be operative in all closed positions.

Most outlet valves had stop-pins and pin-stops, but about 25 per cent of the inlet valves had to be equipped with them. This was an easy matter. Holes were drilled and tapped, pins threaded and screwed in. Threaded pins were found to be more permanent than sweated or driven ones. Practically all bottom plates afforded ample drainage and defective ones were readily improved.

From the work done on these valves, we found that the vertical leak groove was most desirable. A horizontal groove is satisfactory only when leakage occurs in a vertical direction, as in a flow-diversion valve.

Due to the ease with which stop-pins can be broken or abused, we found the most desirable arrangement by having the shell cut away on one side, thereby eliminating two pins. This also makes the valve irreversible.

Inlet valves should be self-draining in all closed positions because, with an accumulation of raw milk in the plug, it is possible for this milk to leak into the inlet line leading to the pasteurizer through a deep scratch such as may be caused by turning the valve with a piece of abrasive substance in it.

The result of this equipment improvement program has been a definite decrease in the number of samples of milk found, which the phosphatase test indicates not to have been properly pasteurized.

SUMMARY AND CONCLUSIONS

The phosphatase test, when originally applied, showed a relatively large proportion of samples of milk and cream to be improperly pasteurized, due principally to improper construction and operation of pasteurization equipment. An intelligent study by the health officer of the reasons for pasteurization failure makes it possible for him to insure the use of proper pasteurization equipment and methods to the end that errors may be very nearly eliminated.

Application of the Phosphatase Test to Creamery Butter*

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ACCURATE control of the temperature and the time of heating in the pasteurization for dairy products is essential to good public health practice. Formerly the only proof of an adequate treatment was the chart of the recording thermometer. This in turn depended not only upon the integrity of the operator, but also upon the accuracy of the instrument itself. Therefore, the development of a dependable laboratory test to indicate the thoroughness of pasteurization has been widely welcomed and to date the phosphatase test appears to have the most promise as an effective laboratory method for the control of proper pasteurization.

The original phosphatase test was developed by H. D. Kay and W. R. Graham in England in 1935.[1] These workers found that a phenol value of 2.3 Lovibond blue units or less produced in a sample of milk treated with buffered substrate and incubated for 24 hours at 37° C. would be indicative of properly pasteurized milk which had been heated to 145° F. and maintained at that temperature for 30 minutes. Kay and Neave [2] later reported that for the American conditions of pasteurization at 142° F. for 30 minutes, a 2½ hour incubation was sufficient. Data collected by Storrs and Burgwald [3] in their studies of the phosphatase test under commercial conditions indicated that 2.3 Lovibond blue units as reported by Kay and Graham for samples incubated 2½ hours constitutes a proper standard for milk pasteurized at 143° F. for 30 minutes.

These standards which have been developed for the holding methods of pasteurization are not practical to apply to creamery butter practice inasmuch as the vast majority of creameries in this country use the flash method of pasteurization due primarily to volume considerations. Last year Parker and Brengman [4] reported that for cream pasteurized under a variety of commercial conditions of "flash" pasteurization, a temperature of at least 185° F. for 2 to 3 seconds is necessary in order to obtain a maximum reduction of bacteria as determined by the plate method. Incidentally in their studies, a preheating period of 30 seconds was used to raise the temperature from approximately 100° F. to the pasteurizing temperature. Pasteurizing temperatures below 185° F. were found to be not as effective as temperatures of 185° F. or higher. The conditions of high-temperature short-hold pasteurization of 160° F. for 15 seconds has never been studied in the pasteurization of

* Read at a Joint Session of the Laboratory, Public Health Engineering, and Food and Nutrition Sections of the American Public Health Association at the Sixty-seventh Annual Meeting in Kansas City, Mo., October 28, 1938.

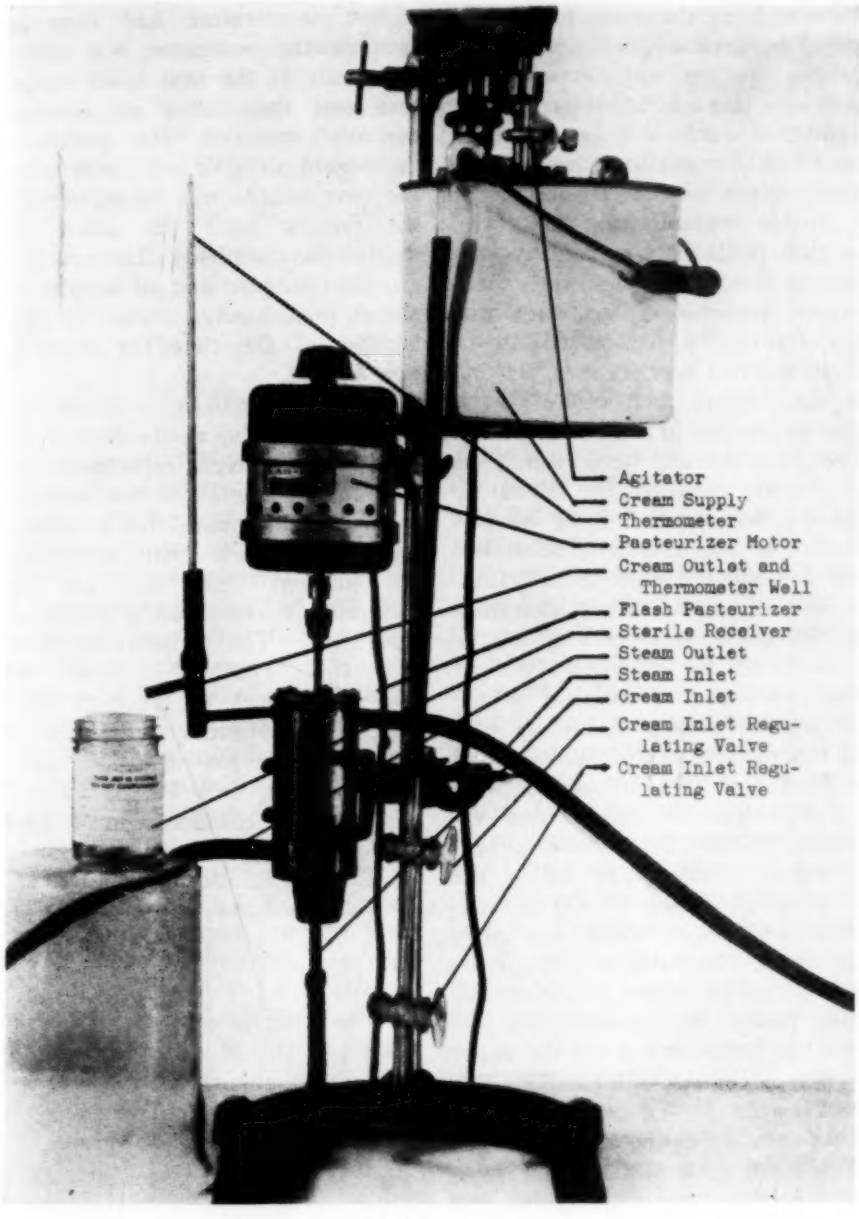

FIGURE I

cream for butter making. Therefore, our studies have centered upon the establishment of standards for the phosphatase test which are applicable to cream for butter making which has been heat treated by "flash" pasteurization.

Our first problem was to duplicate, on a laboratory scale, the practical conditions prevailing in the so-called "flash pasteurizer" found in so many commercial creameries. We finally devised a miniature "flash pasteurizer" with which it is possible to control the time

required to bring the cream to the pasteurizing temperature.

Before making any experimental studies with this laboratory pasteurizer, the entire assembly was first carefully cleaned and then sterilized under steam pressure, to preclude the possibilities of any outside contaminating influences. After such preliminary precautions, the apparatus was set in motion to heat successive portions of the same raw cream (previously neutralized) to a series of different temperatures, starting with the highest temperature to be studied as the first in any series. When the temperature and time conditions were properly regulated the laboratory equipment was operated for 5 minutes at the highest temperature to be studied before any samples were taken. Inasmuch as the capacity of our laboratory flash pasteurizer was operated at the rate of 60 cc. per minute (1 cc. per second), we found it convenient to take small samples for our studies of bacterial destruction. Incidentally, in all experiments outlined, 30 seconds were required to heat the cream from approximately 100° F., to the various temperatures studied. In taking the bacteriological samples, 2 or 3 cc. constituted our sample, which was taken at the outlet. Inasmuch as the samples were taken at the outlet, no appreciable holding period was involved, for the instant the heated cream left the outlet and came in contact with the glass side of the sample jar, the cream was precooled, inasmuch as the sample jar was thus collected (generally 2 to 3 cc. in as many seconds), 1 cc. of the sample was immediately transferred to a sterile water blank for dilution purposes, which provided further cooling, as the sterile water was also at room temperature (70° F.). The combined operations of sampling and preparing a dilution of the sample consumed from 10 to 15 seconds.

When the cream pasteurized at the highest temperature had thus been sampled, the pasteurizer was adjusted to operate at the next lower temperature and then, after an additional minute's operation (to permit the thorough flushing of any hotter cream), the next sample was taken, repeating the process until the series being studied was completed. This raw cream was then sampled and all samples were plated immediately—within 30 to 45 minutes of the time the experiment was started.

In our preliminary work we made studies upon the destruction of bacteria in six different experiments upon six different batches of raw neutralized cream. We examined the samples for the standard plate count, using standard nutrient agar, and for yeast and mold colonies, using potato dextrose agar. The temperatures studied were 165°, 170°, 175°, 180°, 185°, 190°, and 195° F. In only two of the six experiments did yeasts and molds survive pasteurization, and in both instances only at 165° F. The pasteurization efficiencies in all six ex-

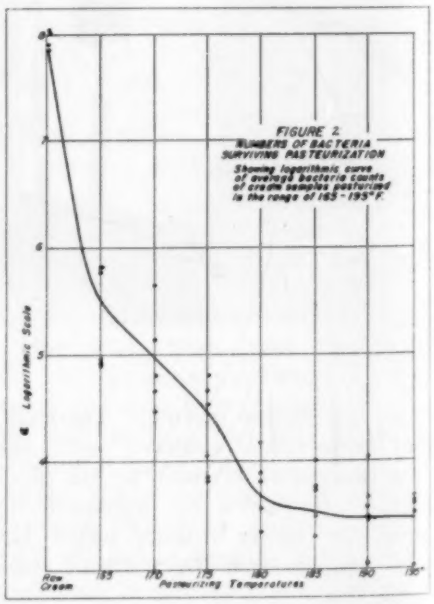
FIGURE 2.
NUMBERS OF BACTERIA SURVIVING PASTEURIZATION
Showing logarithmic curve of average bacteria counts of cream samples pasteurized in the range of 165°-195° F.
Logarithmic Scale
Raw Cream
Pasteurizing Temperatures

TABLE I

Cream "Flashed" at Different Temperatures

Pasteurizing Temperature	*Yeasts and Molds*	*Coliform Bacteria*	*Standard Plate Count*	*Short Method*	*Lovibond Blue Units*		
					2½ Hrs.	*8 Hrs.*	*24 Hrs.*
Raw, neutralized	244,000	880,000	8,500,000	pos	10	10	10
Degrees F.							
160	56	450	40,000	pos.	6.0	7.2	8.6
170	—	—	5,000	pos.	5.0	6.4	7.6
175	—	—	4,700	doubtful	3.0	3.0	3.1
180	—	—	350	neg.	2.1	2.0	2.6
185	—	—	150	neg.	1.9	2.0	2.3
190	—	—	60	neg.	1.6	2.0	2.3
Blank					—	—	0.7

(—) denotes less than 1 per cc. in microbiological examinations

periments exceeded 99 per cent as measured by the standard plate count for all the temperatures studied.

In order to give you a picture of what the bacterial survivals were, we have compiled a curve in Figure 2, representing the logarithms of the average counts for each temperature, while the logarithms of the actual counts themselves are plotted. It was necessary to use the logarithms in order to illustrate adequately the bacterial survivals. In referring to the graph, it is obvious from the slope of the curve that considerable differences in the survival of bacteria were obtained in comparing 165°, 170°, 175°, and 180° F., with each other. Above 180° F., and particularly above 185° F., it is obvious that the differences in bacterial survival became less marked; in fact, the average standard plate counts of the different creams pasteurized at 180°, 185°, 190°, and 195° F., averaged 3,000, 2,330, 2,000, and 2,000 per cc. respectively.

In another series of studies, we have applied to cream samples "flash" pasteurized at 160°, 170°, 175°, 180°, 185°, and 190° F., a slightly modified form of the short method of Scharer and the 2½, 8, and 24 hour incubation technics of Kay and Graham using the Lovibond tintometer for measuring the color production by indophenol. In Table I are given these data as well as the yeast and mold counts obtained with 5 days' incubation at 21° C. using potato dextrose agar, the coliform bacteria counts obtained in 18–24 hours at 37° C. using violet red bile agar and the standard plate counts obtained with 48 hours' incubation at 31½° C. of the differently treated samples. Incidentally, in these experiments a period of approximately 30 seconds was used in bringing the temperature of the cream from approximately 90° F. to the "flashing" temperatures studied. The heated samples were maintained at the different temperatures for a period of 2 to 3 seconds and then cooled as rapidly as possible in a film similar to that condition encountered in the surface cooling of milk by cabinet coolers. As soon as the samples were cooled, they were plated for the different microbiological examinations, following which they were prepared for the different phosphatase tests as outlined. Sour cream which previously had been adjusted to an acidity of 0.23 per cent (as lactic acid) was used for this experiment. All equipment used in these cream studies was previously sterilized by autoclaving at 15 lbs. pressure for 30 minutes.

The data given in Table I are generally representative of the results obtained in similar experiments. We are

listing in Table II the range of the results obtained in applying the phosphatase tests to cream samples "flashed" pasteurized at the temperatures indicated. Such results were obtained from at least nine experimental trials as described above.

TABLE II

Normal Range of Results Obtained in Applying Phosphatase Tests to Cream "Flashed" at 175, 180, and 185° F.

"Flashing" Temperatures Degrees F.	*Short Method*	*Lovibond Blue Units*		
		2½ Hrs.	*8 Hrs.*	*24 Hrs.*
175	Doubtful to Negative	3.0–3.2	2.9–3.0	3.0–3.1
180	Negative	2.1–2.3	2.0–2.2	2.6–2.9
185	Negative	1.9–2.3	2.0–2.1	2.3

From the data in Tables I and II it is evident that "flash" pasteurization at 185° F. for 2 to 3 seconds is adequate as indicated by the production of less than 2.3 Lovibond blue units in samples incubated 2½ hours or 8 hours and not more than 2.3 units in 24 hours.

In actual plant practice we have had the experience that cream presumably "flashed" at 180° F. gave a positive phosphatase reaction by the short method and Lovibond blue units of 4.4 at 2½ hours and 7.2 units at 8 hours. In checking the plant performance we discovered that the recording thermometer chart showed that the pasteurizing temperature of the cream had fallen below 180° F. for 2 or 3 minutes during the continuous operation. The record showed the lowest point to be 177° F. Although we found the instrument to check accurately with a certified thermometer, the possibility that the pasteurizing temperature may actually have fallen below 177° F. cannot be successfully eliminated inasmuch as the instrument involved did not exercise maximum sensitivity under the conditions of operation prevailing at that time. Later in subsequent trials in which the temperatures were maintained within the range of 181° F. to 183° F. we found the mixed cream constituting the complete run which had been so pasteurized, gave a negative reaction by the short method and phenol values of 2.2 Lovibond blue units for the 2½, 8, and 24 hours incubation periods. These lower phenol values in the commercial samples are doubtlessly due to the fact that the "flashing" temperatures of 181°–183° F. were maintained for approximately 15 seconds. Repeated plant trials where temperatures of 185° F. or higher were used have consistently given similar results. In fact, where positive results have been obtained upon samples of cream by any of the methods mentioned we have found without exception that the pasteurization practice has been inadequate, due to faulty thermometers, the leaking of raw cream into the pasteurized cream or some similar defect.

In applying the short method to cream samples we have found the use of amyl alcohol an indispensable aid inasmuch as the failure to use the same markedly impairs the sensitivity of the test. We have also had the experience that doubtful or even negative interpretations have been applied which gave positive results when the blue color otherwise obscured was extracted by the addition of the alcohol.

In view of the fact that extensive use of butter cultures is made in an effort to impart or develop characteristic

flavor and aroma, we have made some studies of such cultures or starters to determine how they might influence the phosphatase test applied either directly or to cream inoculated with the same. On all samples of starters made from milk pasteurized at 180° F. for 1 hour, and irrespective of the acidity to which the culture was ripened, we have never obtained a positive test by the short method. The highest phenol value we have ever obtained on butter cultures prepared from milk pasteurized at 180° F. for 1 hour was 2.1 Lovibond blue units after 24 hours' incubation.

We have made some studies on cream "flash" pasteurized in the laboratory and also under commercial conditions. A quantity of cream "flashed" at 183° F. under commercial conditions and maintained at this temperature for approximately 15 seconds gave a negative reaction by the short method and phenol values of 2.2 Lovibond blue units with the 2½, 8, and 24 hour incubations. The butter churned from such cream gave a negative reaction with the short method and phenol values of 1.6, 1.7, and 1.7 for the 2½, 8, and 24 hour incubation periods respectively. Inasmuch as this work was confined to only one trial further study of this point is necessary.

We have, however, made some laboratory studies upon the butter made directly from cream "flashed" at different temperatures similar to methods outlined in the cream experiments discussed above. The results of two of our experiments are shown in Table III.

The data in Table III tended to give further confirmation to the adequacy of 185° F. or higher as the proper temperature of "flashing" cream for creamery butter making. However, further work on the proper amount of butter serum to use is contemplated.

We have applied the short method to water supplies used for washing butter and also to butter salt with negative

TABLE III

Results Obtained in Applying Microbiological Examinations and Phosphatase Tests to Butter Samples Churned from Adjusted Sour Cream "Flashed" at Different Temperatures

"Flashing" Temperatures Butter from:	*Yeasts and Molds*	*Coliform Bacteria*	*Standard Plate Count*	*Kay & Graham Lovibond Blue Units 8 Hrs.*
Raw neut. cream	621,000	54,000	14,500,000	Over 10
Degrees F.				
170	—	—	5,600	4.0
175	—	—	900	3.2
180	—	—	280	2.4
185	—	—	30	1.6
190	—	—	30	1.6
195	—	—	120	1.6
200	—	—	40	1.6
Raw neut. cream	50,000	565,000	5,500,000	Over 10
170	55	120	5,000	Over 10
175	2	10	1,200	7.8
180	—	—	100	2.6
185	—	—	50	1.6
190	—	—	50	1.6
195	—	—	50	1.6
200	—	—	10	1.6

(—) denotes less than 1 per gram

results. The same was found to apply to both lime and soda neutralizers used for adjusting the acidity of sour cream. Chlorine solutions containing not more than 50 p.p.m. also gave negative results—in fact, the greatest phenol value obtained with 24 hours' incubation was 1.2 Lovibond units. All such samples tested were obtained from creameries operating in the States of Illinois, Indiana, Iowa, Missouri, Kansas, and Oklahoma.

We have had the experience that samples of butter giving a negative reaction with the short test when fresh would give a doubtful or a positive reaction after being held 8 days at 70° F. for the keeping quality test. In fact, over 90 per cent of our samples which entered the keeping quality test as negative have given a positive reaction upon completion of the keeping quality test. That phenol production in such samples might be attributed to bacterial activity appears to be indicated by the facts that, (1) sera from fresh butter samples which originally gave a negative reaction still give a negative result when two drops of chloroform per 0.5 cc. of serum was added and held for 8 days at 70° F. while the same sera to which no chloroform was added gave a positive reaction under similar conditions of holding, and (2) the same sera held 8 days at 42° F. without the addition of chloroform gave negative results for indophenol by the short method. Whereas butter is normally 30 days old before it reaches the consumer and, during the interim between its manufacture and its consumption, is subjected to a variety of temperature changes, it is desirable that more be known concerning its history before a positive phosphatase reaction can be definitely attributed to improper pasteurization of the cream from which the butter was made. Incidentally, we have had the experience of having butter which gave a negative phosphatase reaction by the short method develop a definitely positive reaction after overnight storage in a refrigerator where a motor used for circulating brine developed a short circuit and, due to fuse failure to break the circuit, burnt the armature windings and charred the wooden wedges. The smoke which developed contaminated some of the exposed surfaces of butter which then gave a positive reaction. We are now investigating the possibility of similar reactions of butter stored under refrigeration with smoked meats or meats impregnated with smoked salt.

A chlorinated surface water supply in which the possibility of slight phenol production due to the oxidation of algae-growth giving to butter washed with the same a positive phosphatase test even though the cream used in its production is apparently adequately pasteurized, has just recently come to our attention. Unfortunately, we are unable at this time to give any definite information.

These different experiences and results obtained with the phosphatase test demonstrate clearly the desirability—in fact, the necessity of making check determinations for indophenol in order to preclude pseudo-phosphatase reactions.

We have used both the Kay and Graham reagents and methods in many of our determinations. The usual precautions of fresh reagents and clean glassware which had been washed with phenol-free detergents and then thoroughly dried before use have been meticulously observed. In using the short method of Harry Scharer,[5] we have made certain modifications which appear to give us better end points with which we have been able to determine more accurately a positive or a negative result. We have increased the incubation time from 10 minutes at 100° F. to 15 minutes at 105° F. This added

time and temperature appears to give a better agreement when compared with the longer methods of Kay and Graham.[1] The addition of amyl alcohol apparently gives a better extraction of color with less difficulty of forming an emulsion which will not allow the color to rise to the surface of the sample.

In preparation of our butter samples we melt butter in a water bath at 45° C. for 20 minutes, allowing the sera to settle to the bottom of the conical centrifuge tube. A clean pipette is then used to withdraw 0.5 cc. of the sera and then transferred to the test tubes containing 5 cc. of the buffered substrate solution.

SUMMARY OF RESULTS

1. Our experiments upon sour cream adjusted to conventional churning acidities and "flashed" at different temperatures have indicated that 185° F. or higher will give negative phosphatase reactions upon samples treated by a modification of the Scharer short method as well as by the Kay and Graham 24 hour incubation method.

"Flashing" cream at 180° F., however, gave negative results by the modified Scharer short method as well as by the 2½ hour and 8 hour incubation methods of Kay and Graham, although doubtful results were obtained by using the 24 hour incubation period.

Cream "flashed" at 175° F. gave doubtful results by the modified Scharer short method and positive results with the Kay and Graham methods whereas "flashing" below 175° F. gave positive results with all methods.

2. Butter freshly made from sour cream of adjusted acidity which had been "flashed" at 185° F. or higher gave negative phosphatase tests when using the modified Scharer short method and the Kay and Graham 24 hour technic.

3. Some indications of possible phenol production by bacterial activity in butter samples subjected to the keeping quality test of holding at 70° F. for 8 days (100 per cent humidity) have been observed.

4. Due to factors which may stimulate phenol production in butter subjected to normal changes in temperatures and environment during the interim between its manufacture and consumption, caution should be exercised in interpreting a positive phosphatase test as indicative of the inadequate pasteurization of the cream used in its manufacture.

5. Further work should be done to establish the equitable amount of sample of butter serum to be used to interpret its relation to the original cream from which the butter was made.

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The New Appraisal Form for Local Health Work*

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IT is indeed a pleasure to present the *Appraisal Form for Local Health Work* to the International Society of Medical Health Officers. Since 1924, when the first generally accepted schedule for appraising public health services was developed by Rankin, Crumbine, and others, the health officers of the country have been its severest but most constructive critics and therefore its strongest friends. They have contributed to its success and sound development by making available their personal experience and the collected records of their departments at times of revision. They have been quick to recognize advantages and equally quick to recognize and speak frankly of inconsistencies and shortcomings.

It has been my extreme good fortune to have the privilege of participating both in the development of the original tentative schedule in 1924 and the subsequent revisions, including the present one. Those of you who have sat around the discussion table when revisions were in progress will, I am sure, agree that those occasions are practically a complete course in public health administration. To have present-day health practice in the various fields of public health service discussed by such people as Winslow, Chapin, Godfrey, Freeman, Ruhland, Waller, Leathers, Whitaker, Bishop, Fleming, and Sippy, is stimulating. It is invaluable, however, in developing a practical measuring rod for public health services, to have the discussion of these practices which comes by letter, by personal contact, and otherwise from city and county health officers all over the country as they use the various editions, or attempt to apply them to their own programs.

In keeping with the Association's policy over the years, of seeking the aid of health officers in the field in the revisions of the *Appraisal Form*, the specific advice of about 50 health officers who had used the Form was sought with regard to a half dozen questions of policy in this revision. The opinion of this group was that:

1. The *Appraisal Form* should be a convenient guide to health workers in the development of a program.
2. The standards set up should represent the optimum range of practice throughout the country.
3. The revised Form should not be less inclusive than its predecessors.
4. With all its faults, score was an essential element if the Form were to continue to be as useful as all testified it had been.

With these general sailing orders, the committee set to work with the

* Read before the International Society of Medical Health Officers in Kansas City, Mo., October 24, 1938.

FIGURE I (1)

9. **Hospital Facilities**

Type of hospital[1]	*Ownership or control*[2]	*Number of beds*	*Number of bassinets*	*Average occupancy*	*Total patients*	*Total patient days*

[1] General, tuberculosis, mental, etc.
[2] Non-profit association, state, county, city, private, etc.

FIGURE I (2)

14. **Personnel**

b. Local hospitals, clinics, nursing and maternity homes	*Public*		*Voluntary*		*Total*	
	Part time	*Full time*	*Part time*	*Full time*	*Part time*	*Full time*
Physicians						
Nurses						
Pharmacists						
Other professional (specify)						
Non-professional (specify)						

understanding among its members that nothing in the Form was sacred and any suggestion for improvement would be considered.

CRITICISMS

Out of the considerable experience in use of the Form by members of the staff of the Association and many

others came varied criticisms which were also used to guide the committee. Among the chief of these were:

1. The Form did not fit every community.
2. It gave score on services that were not needed.
3. It was too long and complicated.
4. It presupposed a standard program.
5. It penalized a small staff.
6. It presumed that the health officer had intimate knowledge of medical practice in his community.

COMBINATION OF URBAN AND RURAL FORMS

It will be recalled that the *Appraisal Form* was first developed for urban areas and after 3 years' experience a rural schedule was set up to take into consideration the differences in the development of health service in cities and counties. In this revision, a committee was well along in its work on the *Rural Form* when it was found that 94 per cent of the items which had been tentatively selected for the revised edition would apply equally well to urban areas. After careful consideration of the implications of this step, the two committees were merged and a single Form applicable to both urban and rural local health services was developed.

Throughout the years there has been one guiding principle which the committee has kept continuously in mind,

FIGURE II

8. **Diphtheria Control**	*Value of Item*	*Item for Scoring*	*Value Assigned* HD	OOA	VA	Tot
a. Contacts examined by a health department diagnostician at time of epidemiological investigation and time of release and cultures made of suspected cases	2					
b. Cases and contacts released after 12 days or two successive negative cultures	1					
NOTE: Where diphtheria shows a zero incidence, items a and b should be omitted from consideration in appraising.						
c. Immunization of children under 5 years of age	10	10				
Standard: 60 per cent of population under 5 years of age known to have received immunizing agent against diphtheria						
Percentage — 60 plus . . . 10 *points*						
50–59.9 . . . 9						
40–49.9 . . . 8						
30–39.9 . . . 6						
20–29.9 . . . 4						
10–19.9 . . . 2						
Less than 10 . . . 0						
Children protected ..... ÷ population under 5 ..... X100 = ... percentage under 5 protected						

FIGURE III

28. Obstetrical Service—continued	Value of Item	Item for Scoring	Value Assigned			
			HD	OOA	VA	Total
b. Nursing service at time of delivery (interpreted to mean registration of mothers with and regularly visited by nurses for not less than 3 months before delivery as well as at time of delivery)	10					
Standard: Number of cases registered at least 3 months before delivery equal to 25 per cent of births occurring in the home						
Percentage — 25 plus . . . 10 *points*						
23–24.9 . . . 9						
21–22.9 . . . 8						
19–20.9 . . . 7						
17–18.9 . . . 6						
15–16.9 . . . 5						
13–14.9 . . . 4						
11–12.9 . . . 3						
9–10.9 . . . 2						
5– 8.9 . . . 1						
Less than 5 . . . 0						
Cases registered ..... ÷ births occurring at home ..... X100 = ... percentage of home deliveries supervised.						
NOTE: In areas where the number of home deliveries is less than 100, this item may be omitted from consideration in appraising.						

namely, that all parts of the public health program must be considered from the viewpoint of the administrator —the health officer—rather than from the point of view of the specialist, such as a director of a particular service, and, though the committee has continuously sought the advice and assistance of the special groups—laboratory, sanitation, vital statistics, epidemiology, child hygiene—it has tried to maintain a proper balance of emphasis which at times has not been easy.

THE NEW FORM

The present Form consists of three main parts. Part I, General Information, has been greatly enlarged in this issue to provide a place for recording pertinent facts in some detail regarding administrative organization of health services, finances, economic status, the racial and age distribution of population, vital statistics relating to births and to deaths from certain causes, hospital and medical facilities, public health personnel.

Part II, is a detailed schedule for surveying and appraising selected health activities which are believed to be indicative of the community service.

In Part III, Selected Health Indices, the most objective and significant items from sections I and II are brought together for easy review.

To give a better idea of material

contained in these sections, I should like to present a few specimen items. From Part I, I have selected the table showing hospital facilities (1) and medical personnel (2) (see Figure I), as illustrative of the type of information which one should have about a community as a preliminary to appraising its health services.

I must present a number of sample sections from Part II in order to illustrate the various types of change made in this revision.

VARIABLE BASE

Figure II illustrates the most far reaching change which has been made in the *Appraisal Form,* namely, the variable base for scoring. To avoid the obvious error, which has been frequently criticised in the past, of making a service a requirement where no service is necessary because of the nature of the problem, scoring in this edition is on a variable base. The first two items under diphtheria control shown in this table clearly cannot be carried out unless diphtheria is present and these items, as the note indicates, may be omitted from scoring in an area where no diphtheria is present in the year under consideration. The third item, however, I am sure you will all agree, is at present universally applicable and all communities may well be rated on the percentage of the population under 5 years who have been immunized.

In Figure III, a similar example of this principle in another field is shown in obstetrical nursing service. Here the determination of whether the service should be scored on or not in a particular area depends upon the demand for this type of service, it being the opinion of the committee and its consultants that unless there are 100 women delivered at home each year it is questionable whether such a service can be economically offered by a health department. This item also illustrates another point, namely, that the *Appraisal Form* is attempting to keep pace with changing practices in public health work. The percentage of the deliveries for which nursing assistance is expected has been raised from 5 to 25.

Figure IV illustrates a different kind of variability and is drawn from the section on water supply. Here the item with the dagger applies only to rural areas and is omitted from consideration when the Form is applied to cities, and items c and d, dealing with industrial water supplies, are taken into consideration only in urban areas. Item a, which is not shown, rates the percentage of urban population served with a public water supply.

Such changes as these make the Form much more specific for the community under consideration and while it throws out any possibility of direct comparison of scores between communities, it does not vitiate comparison of scores of the same community from year to year as the variation in scoring base is simply a reflection of the changing health problems.

QUALITATIVE CRITERIA

Probably the criticism of the Form most frequently made was that it did not give sufficient consideration to the quality of service rendered but scored entirely upon quantity performance. The committee has sought to include qualitative standards wherever possible. One difficulty confronted in this attempt was that there are so few fields in which acceptable standards of quality have been developed. Another point which must be borne in mind is that though services are expressed in quantitative terms, the summation of these may truly reflect the quality.

As examples of such changes, may I cite the criteria set up for judging the typhoid fever control services as shown

FIGURE IV

42. Water Supply	Value of Item	Item for Scoring	Value Assigned HD	OOA	VA	Total
b. Rural population provided with satisfactory water supply	8†	8†				
Standard: 50 per cent of rural population provided						
Percentage—50 plus . . . . 8 *points*						
45–49.9 7						
40–44.9 6						
35–39.9 5						
30–34.9 4						
25–29.9 2						
20–24.9 1						
Less than 20 0						
Percentage—Sub-total *b*—column 6						
c. Health department has knowledge of all industrial plants using city supply for emergency purposes	2*	2*				
d. Emergency services approved by state department of health	8*	8*				
Standard: 100 per cent approved						
Percentage — 100 . . 8 *points*						
95–99.9 . . 6						
90–94.9 . . 5						
85–89.9 . . 3						
80–84.9 . . 2						
75–79.9 . . 1						
Less than 75 . . 0						
Emergency services approved						
÷ total emergency services						
X100 = ... percentage approved						

* For cities only.
† For rural only.

in Figure V. The first three of these are definitely indications of quality of the service. To be sure in appraising an area, one must be certain that the practice is consistent in the handling of all cases. This may mean spending time in the field with the individual who is responsible for this activity.

Figure VI is an example of the inclusion in the *Appraisal Form* of definite standards which have already been set up by recognized leaders. In this instance the criterion of minimum satisfactory treatment of syphilis as established by the Coöperative Clinical Group is incorporated as a scoring item.

The criteria set up for judging institutional care of tuberculous cases are examples of the possibility of judging quality through the application of quantitative criteria. These criteria are shown in Figure VII. Early editions of the Form were content to judge the adequacy of institutional

FIGURE V

9. **Typhoid Fever Control**	Value of Item	Item for Scoring	Value Assigned			
			HD	OOA	VA	Total
a. Routine practice to secure stool and urine cultures of contacts at time of epidemiological investigation . . .	3					
b. Routine practice to require negative stool and urine cultures at least 1 week apart and when patient is clinically recovered before cases are released from observation	3					
c. Agreement with health department signed by all known carriers regarding occupation and health habits . .	2					
d. Typhoid vaccine freely available . . .	1					
NOTE: Where typhoid fever shows a zero incidence items a, b, c, d, should be omitted from consideration in appraising.						

FIGURE VI

18. **Treatment of Cases**—continued	Value of Item	Item for Scoring	Value Assigned			
			HD	OOA	VA	Total
e. Treatment of syphilis cases under treatment at clinic on January 1 last year	4	4				
Standard: 60 per cent having had 20 arsphenamine and 20 heavy metals						
Percentage — 60 plus . . . 4 *points*						
50–59.9 . . . 3						
40–49.9 . . . 2						
30–39.9 . . . 1						
Less than 30 . . . 0						
Cases having 20/20 ..... ÷ cases under treatment a year ago ..... X100 = ... percentage adequately treated						

care of tuberculosis simply on the number of patient days per death. Each revision has added to this, first emphasizing minimal cases, and, in this revision, attention is also directed to the use of collapse therapy, the prompt hospitalization of cases, and the continuity of treatment.

The organized medical service for maternity supervision is judged by the percentage of total cases under supervision and, as shown in Figure VIII, the average number of visits per case, the extent to which Wassermanns are made as a routine procedure, and the treatment of women with positive reactions. While there are other items that might equally well be selected as criteria of quality in this field, services meeting these requirements will almost without exception be carrying on a good program.

FIGURE VII

25. Institutional Care	Value of Item	Item for Scoring	Value Assigned			
			HD	OOA	VA	Total
a. Hospital patient days[1]	10	10				
Standard: 150 patient days per death						
Patient days—150 plus . . 10 *points*						
125–149 . . 7						
100–124 . . 4						
75– 99 . . 1						
Less than 75 . . 0						
Patient days ..... ÷ deaths = ... patient days per death						
b. Minimal cases hospitalized	3	3				
Standard: 15 per cent of total hospital admissions in minimal stage						
Percentage — 15 plus . . . 3 *points*						
12–14.9 . . . 2						
10–11.9 . . . 1						
Less than 10 . . . 0						
Minimal cases admitted ..... ÷ total admissions ..... X100 = ... percentage minimal						
c. Cases hospitalized within 2 months of report	2	2				
Standard: 60 per cent of cases hospitalized						
Percentage — 60 plus . . . 2 *points*						
40–59.9 . . . 1						
Less than 40 . . . 0						
Cases hospitalized within 2 months ..... ÷ cases hospitalized ..... X100 = ... percentage hospitalized within 2 months						
d. Facilities available for initiation of collapse therapy and supervision of cases	5	5				

[1] This item is defined to mean the total number of patient days of hospital care for residents and includes days in state, county, or municipality or private hospital, whether the care is given at public or private expense, within or without the area.

NOTE: "Minimal" is defined to mean: slight lesions without demonstrable excavation confined to a small part of one or both lungs. The total extent of the lesions, regardless of distribution, shall not exceed the equivalent of the volume of lung tissue which lies above the second chondrosternal junction and the spine of the fourth or body of the fifth thoracic vertebra on one side.

FIGURE VIII

29. **Medical Service**—continued	*Value of Item*	*Item for Scoring*	*Value Assigned*			
			HD	*OOA*	*VA*	*Total*
b. Visits by cases registered for antepartum supervision	10	10				
Standard: 3 visits per case registered						
Visits — 3 plus . . . . . 10 *points*						
2–2.9 6						
1–1.9 2						
Visits ..... ÷ cases registered ..... = ... visits per case						
c. Blood tests for syphilis	6	6				
Standard: 95 per cent of cases carried for health department supervision tested						
Percentage — 95 plus . . . 6 *points*						
90–94.9 . . . 5						
80–89.9 . . . 4						
70–79.9 . . . 3						
60–69.9 . . . 2						
50–59.9 . . . 1						
Less than 50 . . . 0						
Blood tests for syphilis ..... ÷ individuals registered ..... X100 = ... percentage tested						
d. Positive reactors treated for syphilis . .	5	5				
Standard: 100 per cent of positive reactors under treatment						
Percentage—100 . . . . . 5 *points*						
80–99.9 . . . 4						
70–79.9 . . . 3						
60–69.9 . . . 2						
50–59.9 . . . 1						
Less than 50 . . . 0						
Positives under treatment ..... ÷ total positives ..... X100 = ... percentage under treatment						

INDICES

The third section of the *Appraisal Form* is definitely experimental. Platt in an analysis of the *Appraisal Form* in 1927 pointed out that rating a community on a few typical items gave results which compared favorably with the use of the larger Form. It proved that certain items had definite value as indices of the character of a community health service. Recently there has been a demand for a broader point of view in the formation of public health programs. It is now recognized

FIGURE IX

SELECTED INDICES

	Page	Area	State	States United
POPULATION				
2. Age distribution: Percentage under 20	5			
WEALTH				
9. Assessed valuation per capita	2			
SOCIAL AND ECONOMIC STATUS				
12. Percentage of persons 10 years of age and over who are illiterate	6			
HOUSING AND SANITATION				
20. Percentage of rural population having satisfactory means of excreta disposal	155			
21. Percentage of urban milk supply pasteurized	169			
VITALITY AND HEALTH				
24. Deaths under 1 month per 1,000 live births	8			
30. Diphtheria deaths per 100,000 population	8			
35. Automobiles accident deaths per 100,000 population	9			
37. Percentage of deaths unattended by physician in terminal illness	26			
PERSONNEL AND FACILITIES				
41. Cents per capita expended for official public health purposes	18			
43. Population per physician	15			
PUBLIC HEALTH PRACTICES				
46. Percentage of population under 5 years immunized against diphtheria	43			
48. Number of known living cases of tuberculosis on register per annual death from tuberculosis	81			
55. Percentage of deliveries by midwives in home	8			
57. Percentage of preschool children registered for nursing supervision	125			

as desirable and necessary to consider composition and economic status of the population, the availability of health promoting facilities as well as the character of local health problems in program planning. In order to bring together certain items from which we may select reliable indices of these various factors when a sufficient volume of experience has been accumulated a tentative list of such items is included as Part III of the new Form (Figure IX). Out of such accumulated material we may eventually be able to discover some consistent relationship between economic and environmental factors, health status, and health practices. Only general use and time will tell whether this is a wise extension of the *Appraisal Form* or not.

USES OF THE APPRAISAL FORM

One of the most significant changes in the *Appraisal Form* over the past 14 years of its existence is the change in use. As originally designed it was primarily to serve as a rating schedule in order that city and rural health programs might be graded according to accepted standards of practice. Early editions carried little explanatory material which would indicate why criteria were selected or the basis for standards set up. In fact, the first draft of the City Appraisal Form did not even include a survey schedule. Experience soon indicated that the survey is the most useful phase of an appraisal and that the scoring is simply a convenient method of expressing the findings as they relate to the various phases of the service or the program as a whole. The Form was being used by many health officers as a guide to administrative practice. So, with this edition, this phase has been emphasized and strengthened by inserting brief statements throughout the schedule indicating the philosophy which the committee believes underlies certain services. In several states, aid from the state department is available to local health officers in making periodic appraisals. This has the obvious advantage of giving the health officer another pair of hands to assist in the collection of material and of providing a person with a disinterested point of view, which is always helpful in interpreting the findings of such a study.

With the introduction of the variable base for scoring, the Form becomes in fact primarily a manual of practice, chiefly useful to the administrator in studying the community needs, the function of his department with regard to a particular service, and this trend of development from year to year.

With the introduction of the selected list of health indices, a new instrument is suggested for brief, readily made summaries of the health conditions and needs, and of community characteristics bearing on these conditions and needs. Local health officers may find these indices, or a part of them at least, useful for periodic surveys and comparison. State health officers may find the indices of value to summarize and compare conditions among local areas or to follow trends for periods of time. Here is an experimental tool which may prove especially useful when detailed appraisals are unnecessary or impracticable.

In conclusion, may I reiterate that the Committee on the Appraisal of Local Health Work feels very deeply indebted to the health officers for continued assistance in the development of this document. It is your Form; its primary function is to aid you; without your use of it, your criticisms, and your help, it could not exist. It must keep pace with changing conditions and practices, and we continue to stand ready to serve you in keeping it up to date and as useful as possible.

Practical Methods for the Control of Hygienic Exposures*

G. A. COBURN

Personnel Director, Delco-Remy Division, General Motors Corporation, Anderson, Ind.

FOR the successful solution of any task or problem, certain information and knowledge is necessary. Certain tools and equipment are needed and quite often a certain amount of skill and technic comes in handy.

In launching a campaign for the control of industrial exposures, there are some prerequisites which are necessary for success and others which are highly desirable.

1. One of the first things to know is what exposures exist in your plants, what is the nature and extent of the exposure, what has been done to control them, how successful is this control. In short, a complete survey of the plant is necessary.

The use of the following headings is suggested for the form used in making this survey:

1. Department name and number
2. List of hazardous operations in the department
3. Nature of exposure in each hazardous operation
4. Number of workers exposed
5. Method of control in use
6. Effectiveness of this control
   a. Based on health study of those exposed
   b. Based on air analysis, etc.
7. Recommendations for improvement

Such a survey as this not only gives one a complete picture of the condition of your plant, but helps in determining the points against which your control campaign should be directed. It can also serve as a record.

2. The second necessary item is a physician or medical department that has specific knowledge of the hazardousness of various toxic substances, dusts, etc., from a health standpoint and that also has knowledge of the extent to which these exposures have affected and are affecting the health of the workers.

3. The third prerequisite is a plant engineering force that is interested in the problem and is well versed in the design, installation, and maintenance of hoods, exhaust systems, and other control mechanisms.

4. Another desirable factor is an interested, well informed, and coöperative plant supervisory force.

5. A fifth item which is desirable but not absolutely essential, is the necessary equipment for air sampling to determine dust concentration and air contamination. Such equipment is helpful in determining whether control is necessary and in checking the effectiveness of control used.

6. In view of the fact that the study and control of industrial exposures is of recent growth, it is often desirable to have one individual charged with

* Read at a Joint Session of the Industrial Hygiene and Public Health Nursing Sections of the American Public Health Association at the Sixty-seventh Annual Meeting in Kansas City, Mo., October 28, 1938.

this responsibility. He should be able to coördinate the efforts of the existing medical, engineering, and plant supervisory forces.

GENERAL METHODS OF CONTROL

The overall objective is, of course, to remove all exposures, or, failing in this, to limit exposures to the point where there is no danger, *i.e.*, subthreshold exposures.

Following is a list of the methods of control generally used in industry to accomplish these objectives:

1. Substitution of a safe material for the one causing the exposure, as the use of less toxic solvents for benzol and the use of steel shot for sand in cleaning.

2. Substitution of a safer process for the one causing the trouble, such as wet grinding and drilling for dry grinding and drilling and the use of a wet process in making and handling plates for storage batteries.

3. By preventing the escape of toxic substances and harmful dusts into the air which is used by the workers.

This is accomplished in two ways: first, by making the operation entirely automatic, thus eliminating the worker and then enclosing the equipment so as to prevent the escape of harmful substances. Examples of this method are automatic sand blasters and painting by conveyor dipping or automatically controlled spray guns. Second, by power exhaust ventilation. This method is the most practical and most generally used for the removal of gases, fumes and dust when a worker is essential for the operation. A suitably designed hood is placed close to the source of the trouble, and a suction fan draws the polluted air away to either the outside or to a filtering plant or dust collector.

4. By the use of protective equipment by the worker, such as goggles for eye protection from glare or flying particles, rubber gloves, boots or aprons from acids, oils, solvents, etc., respirators against dust, and gas masks against toxic gases and fumes.

5. By the exercise of proper hygienic care on the part of the worker—proper washing and bathing by those who work in oil, and observing certain health rules by lead workers.

6. By lowering the exposure. This is accomplished by the rotation of workers to less hazardous jobs or by shortening the working hours.

7. By selecting employees for hazardous exposures who are the least susceptible to those exposures. Those who are to be subjected to exposures from dust, fumes, and gases should be free from respiratory difficulties. Lead workers should be free from previous exposures and from ailments of the alimentary tract. Those who are to work in oils, paints, etc. should be free from skin disorders.

PRACTICAL METHODS OF CONTROLLING CERTAIN EXPOSURES

DUSTS

In general there are two classes of dust to be considered:

1. Those capable of producing respiratory troubles, such as fibrosis of the lungs.

2. Those that may cause systematic poisoning, such as lead compounds, etc.

In those industries where many of their products are shaped from cast iron (as is the case with Delco-Remy) the problem of exposures from the dust created by the machining of cast iron, is an important one. While Dr. Sampson, in his recent study of iron ore mining, is of the opinion that ferrous oxide dust is not conducive to tuberculosis, one has in cast iron machining, mixed with the iron dust, considerable silica dust which comes from the sand used in coring and molding. And, of course, with silica there is the danger

of silicosis with its attendant tuberculosis.

Previous to 1934, very little effort had been made by our company in controlling the dust hazard in our cast iron machining departments and as a result work in these departments was considered a dirty job. The workers were convinced, and possibly logically so, that any respiratory difficulties which they had were either caused by or aggravated by the dust to which their work subjected them. Labor turnover was relatively high. Sufficient data are not available to determine whether there was any increase in the tuberculosis rate. The tendency to such an increase was offset by our practice of transferring men "out" of the department to other lines of work based upon the recommendations of the medical department.

During the summer of 1934, the Metropolitan Life Insurance Company made a rather extensive survey of our plants. As a result of this and subsequent surveys by that company and by ourselves, an extensive campaign of dust control has been carried out. On the original survey before any control methods were in use, the dust concentration in our cast iron machining departments ranged from 5 to as high as 12 and 15 million particles per cubic foot of air. Since the installation of exhaust systems, these counts are now as low as 1 million and seldom in excess of 2½ million particles per cubic foot of air. The jobs are now relatively clean and there is little or no complaint on the part of the workers. In fact, these departments are considered very satisfactory places in which to work, and the requests for "transfers out" are few.

The most practical way for removing dust is to place a suitably designed hood around the source of the dust and by a suction fan to draw the dust laden air to either the outside or to a dust collector or filtering system. In view of the fact that the installations of exhaust systems vary considerably with the different types of machines, they are difficult of description.

In general, in the design and installation of exhaust systems, several points should be kept in mind, namely:

1. A given velocity of air is required to carry dusts of a given density—4,000 feet per minute is recommended for most dusts, 5,000 for lead and 2,500 to 3,000 feet per minute for gas, fumes, smoke, etc.

2. That the area of the hood opening must be kept in such a proportion to the area of the pipe carrying the air away from the hood that the velocity of the air in the opening does not fall below the velocity required for moving the dust.

3. The design of the hood is of great importance as the efficiency varies decidedly with different hoods. Also the hood surrounding the source of dust must be so designed and shaped that it will not slow up or hinder the loading or unloading of the fixture on the part of the operator. Otherwise his tendency is to disregard the use of it.

4. The question of heat loss in cold weather must be considered if the dust laden air is to be discharged to the outside. Such a consideration may make it advisable to run the air through a filtering device and then back to the plant.

Occasionally, due to the possible short life of the product or of the particular method of machining in use, the outlay for an exhaust system is inadvisable from a financial point of view. In one such case in machining cast iron, the dust count was reduced from around 15 million to well below 5 million particles per cubic foot of air by the simple expedient of removing all air hose and substituting brushes for cleaning off fixtures and by having the floor swept up after the regular force

had gone home from the shift. If at all possible, holding fixtures should be so designed as to permit the chips and dust to fall free and thus do away with the necessity of blowing them off with air, which increases the dust in the air considerably.

The engineer engaged in designing and installing exhaust systems, having, as he does, a type of mind which demands exactness, would be pleased if he had a definite figure for permissible dustiness. In this regard Drinker states that "the point has not been reached where a manufacturer can be told with certainty that his plant will have no silicosis if he keeps dustiness down to some definite figure."

The varying susceptibility of the employee, the period of exposure, the type of dust, the amount of free silica, the lack of uniformity in concentration are factors which make it difficult to set a figure of permissibility, and one might also add, the lack of definite data.

In the South African gold mines where the dust is said to contain more than 85 per cent free silica, a tentative standard of 8.5 million particles per cubic foot has been set as the upper limit of dustiness allowable.

From the results of a study made by the Public Health Service in the granite cutting industries it was found practicable to suggest a tentative standard for the upper limit of allowable dustiness between 10 and 20 million particles per cubic foot of air for workers exposed to dust resulting from granite cutting. The same limit would presumably be applicable in the case of other dusts of the same physical characteristics, particularly with a silica content of 35 per cent.

The Industrial Commission of Wisconsin reports as follows:

> The maximum silica-dust concentration considered permissible in the air breathed by a workman at any point in the normal breathing zone has not been definitely established. The commission, its advisory committee, employers, and scientists have agreed on a tentative figure of 15 million countable dust particles under 10 microns in longest dimension with free silica content of 35 per cent in a cubic foot of air as determined by U. S. Public Health Service technic. Variations in free-silica content will make proportional inverse changes in this standard. In the case of practically pure silica the permissible dust count would be 5,250,000 countable particles.

More recently other states have established a standard of permissibility in the neighborhood of 10 million. Therefore, in order to give our plant engineering staff a goal toward which to work our company has set up empirically a figure of 5 million particles per cubic foot as being the high range of permissibility. In view of the fact that all of our castings are made from permanent iron mould, and the only source of sand is from the sand cores, it is felt that this figure of 5 million is well on the safe side.

The discussion up to this point has had to do with dusts containing silica. In an average manufacturing plant there are usually a number of other dusts present which are not particularly harmful in that they are not fibrosis producing. However, in view of the fact that dust of any kind is disagreeable and that the average worker feels that "dust is dust," and that any respiratory irritation which he may experience is due to the dust, and since the average practising family physician will usually concur with him in his belief, our company has adopted the policy of controlling all dusts regardless of their nature.

PLATING HAZARDS

Several years ago, our company experienced considerable health difficulties in our plating, particularly chrome plating. Due to the extreme heaviness of chrome fumes the usual method of exhaust ventilation was inadequate. Our troubles continued until new

chrome plating equipment was purchased wherein the control of fumes was an integral part of the equipment. By the present method, the heavy chrome fumes are pulled downward by suction through openings at the edges of the tank, to a container underneath, where a large portion condenses. This air is then drawn through a vertical duct to a cylinder of approximately twice the diameter of the duct. This cylinder has a series of baffles which, assisted by the lowered velocity, entraps the remaining chrome and it is washed back to the container underneath the tank by a small stream of water. This chrome solution which thus collects is added to the original chrome tank.

With this new system, the air shows no trace of chrome and our health difficulties have vanished.

In zinc, copper, cadmium, and nickel plating, theoretically at least, no gases other than oxygen and hydrogen are given off. Actually, as the plating is speeded up, the plating solution becomes heated and some of the solution is carried off with the oxygen and hydrogen in the form of a mist. Thus with the advent of faster and more up to date plating methods, it has been necessary to cover the tanks and provide forced exhaust ventilation.

LEAD

For 10 years, our company has been engaged in the manufacture of storage batteries. No serious cases of lead poisoning have occurred and only occasionally has an employee had a slight touch of it. In general our method of control is as follows:

1. Employ only those people who have been free from lead exposure in the past and only those who are free from ailments of the digestive organs.
2. Isolate all operations which may give off lead dust from those that do not.
3. Keep the floors, paste machines, conveyors, and pasted plates wet at all times to prevent the giving off of dust.
4. Make regular analysis of the air for lead at the strategic points of exposure and endeavor by means of exhaust controls to hold the lead content of the air down to a safe point.
5. Physical examination of all lead exposed employees once a month, and at the slightest indication of lead intoxication, transfer the worker to a job with little or no exposure.
6. Require the worker to wear a respirator in those few places where the lead concentration is above a safe point.
7. Insist on personal cleanliness and hygiene on the part of the worker.

SOLDERING

Throughout our plants, there are soldering operations which are done by machine, by dipping or by an electric solder iron. Most of these operations are provided with exhaust ventilators, not so much to prevent lead absorption, as to remove the smoke incident to the burning of the flux and insulation on the parts being soldered.

BAKELITE

In our bakelite department, the bakelite power is formed into a pill of appropriate size and shape for use in molding.

These pill machines are entirely enclosed in a small room which is provided with exhaust ventilation.

OILS

The control of skin disorders of employees working in oils has always been a difficult problem.

Many different approaches have been made by different concerns. Our company has tried a variety of measures. Our method of approach at present is as follows:

1. A central supply system from which oil is supplied to all plants. This system has a storage tank for new oil

and a settling and filtering set-up for used oil.

2. Use of a protective hand ointment.

3. Program of cleanliness with proper wash room facilities provided.

4. Discontinue the use of kerosene and gasoline for washing hands and use a mineral seal oil instead.

With 400 operators working in oil, there has been only one minor case of so-called oil poisoning in the past 2 years. It is our belief that personal cleanliness is the greatest factor in control.

This completes the list of hygienic hazards with which our company has had to deal. I realize that many of you have numerous other hazards that I have not discussed, because we have had no experience with them.

I believe any company, with a certain amount of determination, plus reasonable intelligence, can successfully control its plant hazards.

DISCUSSION

ASSEMBLED BY CHARLES L. POOL, F.A.P.H.A.

Chief Engineer, Division of Industrial Hygiene, State Department of Public Health, Providence, R. I.

MR. COBURN has outlined the methods available for controlling hygienic exposures and has shown how good engineering practice is able to surpass the physiological dicta in vogue. In order that a prepared discussion might have working value industrial hygienists were asked to submit practical examples in condensed form.

Reduction of Benzol—Toluol Vapors —Gray [1] arranged for Postman [2] to contribute data on their bureau's study leading to correction of exposures to benzol and toluol vapors from impregnation of clutch disks. The Connecticut Department of Health Sanitary Code stipulates maximum concentrations of 100 p.p.m. for benzol and 200 p.p.m. for toluol.

Six minute runs during insertion and removal of disks from an impregnating tank exposed the operator to an average of 350 p.p.m. (490 p.p.m. when a nearby window was opened) of toluol, causing watering of eyes at peak concentrations, and similarly, to 520 p.p.m. of benzol (21 min. run). Twenty minute samples of (a) aisle air between drying ovens showed 920 p.p.m. of toluol and (b) breathing level near drying racks, 480 p.p.m. Through a 7 minute period during removal of disks from drying oven the activated charcoal determination showed an exposure to 150 p.p.m. of toluol (but results may be too low at the high temperatures).

Recommendations included sketches

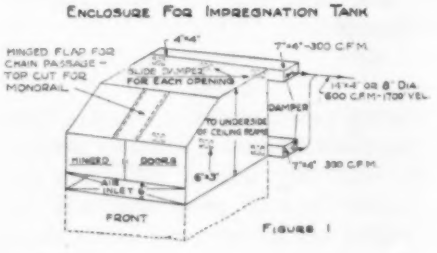

FIGURE 1

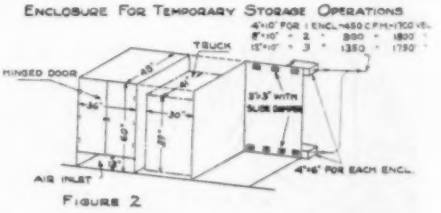

FIGURE 2

(AFTER OUTLINE SKETCH BY) CONN. STATE DEPT. OF HEALTH BUREAU OF OCCUPATIONAL DISEASES S. P. POSTMAN — IND. HYGIENE ENG.

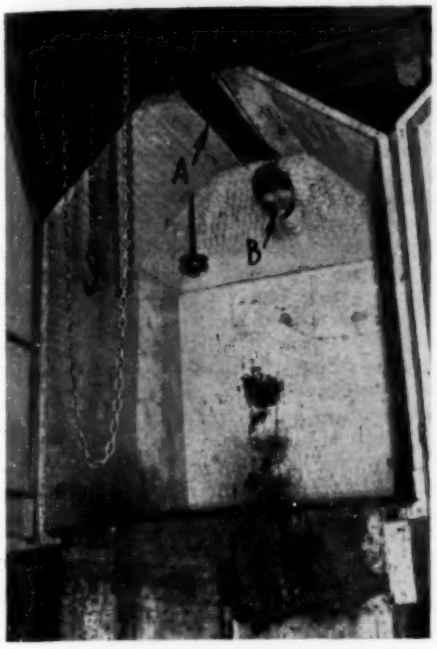

FIG. 3—Interior View of Enclosure Over Impregnation Tank Showing:
A—Slot for Passage of Chain-Hoist
B—Single Exhaust Connection

and outline of designs for control of vapors at points of generation. Fig. 1 outlines an enclosure for impregnating tanks, and Fig. 2 a ventilated chamber for temporary safe storage of treated disks between operations. Fig. 3 shows an interior view of the enclosure in place over an impregnating tank. An enclosure outlined for the floor pressing operation was about 25′ long, 18″ wide and 30″ high, with a dampered opening to each of 16 pressing stations (60 c.f.m. for each). Hinged doors open up each pair of stations. Ducts 8″ by 5″ convey vapors to a fan suction (10″ dia., 750′ vel., 950 c.f.m.).

Suggestions included means for achieving results without hampering the operations, for conserving vapors by double walled tank enclosures, or water-jacketing of exhaust lines where the solvent (toluol) is used hot, dampers for conserving vapors when the enclosures are in place, leak-proofing of dryer housings with maintenance of slight suction, handling of solvents and solutions by pipe line to eliminate addition to tanks from open buckets, stirring with paddles, and emptying by ladles, and use of canister type respirators for the irreducible occasional exposures, e.g., during removal of racks of disks from tanks, and transfer to floor pressing operation.

Determinations of resulting exposures are planned. The installation did not follow the outline in every detail but results are obviously satisfactory.

Isolation of Dusty Process—Lamenzo [3] described an ingenious application of engineering to accomplish inexpensively an improvement in dust control which first looked costly. In making clutch facings, asbestos was loaded into beaters and wet down. From several possible solutions, the insurance carrier recommended to the manufacturer that loading from the beater floor be changed to loading through a chute from a ventilated enclosure placed on the floor above (see Fig. 4).

Asbestos dust on the beater floor was

APPLICATION OF VENTILATION
TO EXTREMELY DUSTY OPERATION

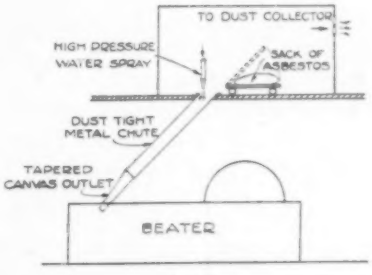

FIGURE 4

AFTER SKETCH BY
HARTFORD ACCIDENT & INDEMNITY CO.
J. B. LAMENZO, RESEARCH ENGINEER

ALTERATIONS TO INCREASE HOOD EFFICIENCY

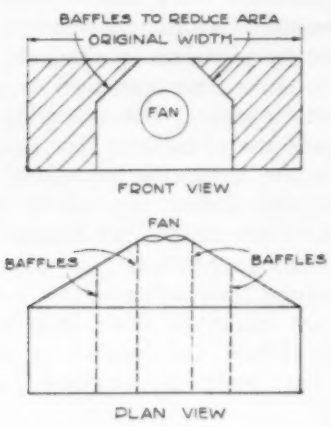

FIGURE 5

AFTER SKETCH BY
LIBERTY MUTUAL INSURANCE CO.
S.W. GURNEY, RESEARCH ENGINEER

reduced from 38 million particles per cu. ft. to very little, if any, remaining. Exposure of 25 men was reduced to exposure to one man, part-time, who was induced actually to wear an approved respirator and to undergo semi-annual physical and X-ray examinations.

Increasing Hood Efficiency—Gurney [4] gave an example of inexpensive home-made alterations on a hood to eliminate cases of lead poisoning among operators of spray guns applying enamel of which the base was a glass frit containing 35 per cent lead. The average velocity at the hood openings was 72 f.p.m. Lead content at the breathing zone was 3.6 mg. per 10 cu. m. of air. Panels were installed as shown in Fig. 5. These increased the average velocity at the new opening to 220–235 f.p.m. with reduction of lead to less than 1 mg. per 10 cu. m. of air, and elimination of cases of poisoning.

Dust Control in a Ceramic Plant—Schulze [5] prepared the following description exemplifying the application of control methods to existing apparatus.

The Porcelain Enamel and Manufacturing Company in Baltimore is engaged in the manufacture of enamels. One of their problems was the protection of workers from dust generated in the dumping of raw materials into batch containers placed on a platform scale below the floor level. The fact that an appreciable amount of free silica in the form of flint is required in each complete batch weighing operation motivated the management to supply those engaged in this occupation with respirators of an approved type. However, since other operations are carried on in the same room it was recommended that steps be taken to reduce the dust concentration in connection with the weighing operation. The management designed and installed the dust collecting system as shown in Fig. 6. The dust-collecting bag was made of unbleached muslin (36" wide by 27' long) at a cost of 7 cents per yard. The muslin used is known as 80 square mesh or 80 threads per inch. The cost of the installation including material and labor was estimated to be about $88. A pipe connected to a motor-driven exhaust fan leads to an opening in the weighing pit; the exhausted dust-laden air is blown into the large filter bag suspended from the ceiling.

DUST REMOVAL SYSTEM
FOR WEIGHING OPERATION

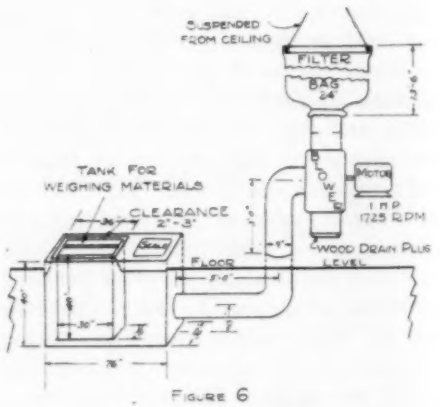

FIGURE 6

AFTER SKETCH BY
BALTIMORE CITY HEALTH DEPT.
BUREAU OF ENVIRONMENTAL HYGIENE
WILMER H. SCHULTZE, DIRECTOR

The efficiency of the installation was determined by making dust counts of the air during the dumping and weighing operations with the dust removal equipment in operation and without the use of this apparatus. Dust concentrations were determined by the impinger method using the procedure of the U. S. Public Health Service.

Dust Concentrations—Millions of Particles per Cu. Ft. of Air	
Dust collector not operating	86.4
Dust collector operating	2.1

Visual inspection of the pictures taken of the weighing operation with and without the use of the exhaust system also show a striking difference in the dustiness of the air.

See Fig. 7 (Companion photo, in which *no* dust is seen, is not shown).

Design Fundamentals for Movable Hoods—Bowditch [6] made available data sheets prepared by Hemeon [7] from studies of their bureau to outline for industries a practical solution of stone cutting hazards. These were condensed:

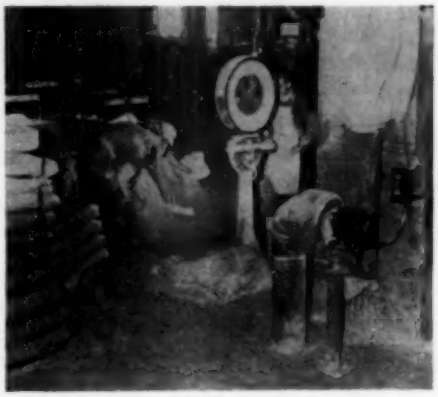

FIG. 7—Weighing Operation. Exhaust System Not in Use.

Essentials of Banker Exhaust Ventilation: A suction device for each banker to keep the quantity of granite dust below 10 million particles per cu. ft. of air. For suction devices with hand pneumatic tools independent of and outside of the exhaust hood, an air velocity of at least 200 f.p.m. at a point 7″ from center of face of hood resting on face of the stone; 6″ when hood is hung unobstructed. Hood easily movable and kept within 6″ of point of tool.

Recommendations: I. *Air Volumes, Plain Unobstructed Hood*—Withdraw not less than 540 c.f.m.

II. *Air Volumes, Flanged Hood*—Withdraw not less than 400 c.f.m. Flange may be metal, rubber, etc., approximately 3″ wide and attached to the two sides and top of the hood which rests on the stone to be cut. Hood efficiency may be increased by the attachment, by a removable pin, of a device to encircle the cutting end of the 4-point chisel.

III. *Duct Construction*—Duct work laid out with fan near middle to exhaust nearly equal number of units from each side. Branch ducts connected to main at angle not greater than 45° and close to the large end of a tapered section. Ducts not to extend into main. Elbows formed of not less than 5 sections for 5″ ducts and 7 sections for larger ducts, with long curve. (The radius of curvature of center line of elbow at least 1½ times diameter.) Enlargements on a gradual taper. Clean-outs for ready cleaning of ducts, e.g., bends, junctions, dead-ends, foot of risers. Dusty air disposed of without recontamination of atmosphere.

IV. *Fan Size*—Determined by diameter of main through which air from all branches flows. Usually of such size that its inlet is not smaller than the main connected.

V. *Fan Speed*—Having fixed fan's inlet diameter, find at what speed it should operate from manufacturer's specifications—(a) capacity desired in terms of total c.f.m., (b) suction necessary at fan.

a. *Capacity of Fan*—Insure that the units at the end of the system get their full quota of air. Units near the fan draw more than those at the end, without balanced flow. Allow for a fan capacity greater than 400 c.f.m. per banker. Allowances estimated for layouts in supplement hereto given for installations of various sizes.

b. *Suction at Fan*—Depends mainly on loss through flexible suction device.

BANKER DUST EXHAUST SYSTEM

TYPICAL PIPING LAYOUT FOR RUEMELIN UNIT
(AND FOR C. F. BERG UNIT, FIGURES IN BRACKETS)

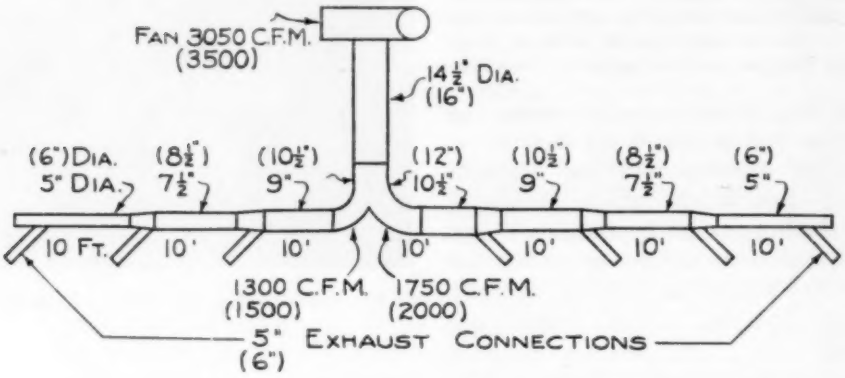

FIGURE 8

AFTER SKETCH BY
MASS. DEPT. OF LABOR & INDUSTRIES
DIVISION OF OCCUPATIONAL HYGIENE

Varies with type. See supplement.

VI. *Motor*—Size depends on fan capacity, desired suction, and fan efficiency. See supplement. Fan driven by motor through belt drive, rather than by direct connection for small speed adjustments for efficiency by changes in pulley size.

Maintenance—Performance of each unit checked by U-tube at least once a month. Cause of any drop in efficiency exceeding 10 per cent remedied.

Supplement is a guide only. Note the limitations stated. If layout requires departure from the essentials, figures given should not be used. No one type of unit is favored above another.

Supplement—The Ruemelin (or the C. F. Berg) Banker Exhaust Unit. Note: Values for C. F. Berg unit given in brackets.

Duct Sizes—When using flanged hoods with the Ruemelin (or C. F. Berg) Banker Exhaust Unit and minimum air volumes indicated, duct sizes listed in Table I and Fig. 8 are advised. Where 5″ (6″) ducts from each of two banker exhausts join, increase the duct size by taper to a 7.5″ (8.5″) dia. Where a third 5″ (6″) exhaust duct joins the 7.5″ (8.5″) duct, increase the size to 9″ (10.5″) and so on as in table. Sizes larger than listed may result in deposits in ducts. Sizes smaller require excess power. Use larger sizes when air volumes are greater than the minimum specified.

Suction at Fan—The Ruemelin (C. F. Berg) Banker Exhaust Unit has an inside hose diameter of 4″ (4.75″) (C. F. Berg duct slides vertically inside a 5″ duct and the connection after the chip trap is 6″ in dia.) The Ruemelin connection to branch pipes is 5″ in dia. To exhaust 400 c.f.m. through this device with a flanged hood, maintain a suction after the trap, as measured by a U-tube, of 3.6″ (2.3″) of water (and 470 c.f.m. for the C. F. Berg unit, to cover leakage). In general, necessary "fan static pres-

sure" will vary from 4" (2") to 6.5" (3"), depending on size of installation and arrangement of ducts.

Hood Characteristics—Check performance by static suction measurements at the hood, taken from at least 4 holes, beyond hood elbow and just before ball joint (10" to 12" above hood elbow), using a minimum air flow of 400 c.f.m., a suction at hood of 2.6" (0.8"), and hood coefficient of 0.93 if with flange; use 540 c.f.m., 6.7" (2.0"), and 0.78, respectively, if without flange. If suction is between 3.7" (1.1") and 6.7" (2") without flange, system may be made to conform by attaching flange.

Motor Size—Depends on number of bankers, suction loss, and fan efficiency. Estimated sizes for systems of various numbers of bankers up to ten are tabulated for bankers not much over 10' apart and no long ducts, particularly in the 5" (6") and 7.5" (8.5") sizes.

TABLE I

Number of Bankers	Approx. Min. Fan Capacity (c.f.m.)		Duct. Dia. and Min. Fan Inlet Dia. (In.)		Approx. Min. Size Motor	
	Ruemelin	(C. F. Berg)	Ruemelin	(C. F. Berg)	Ruemelin	(C. F. Berg)
1	400	(470)	5	(6)	0.75	(0.5)
2	850	(970)	7.5	(8.5)	2	(1)
3	1,300	(1,500)	9	(10.5)	2	(2)
4	1,750	(2,000)	10.5	(12)	3	(2)
5	2,200	(2,600)	12	(13.5)	5	(3)
6	2,700	(3,100)	13	(15)	5	(3)
7	3,200	(3,700)	14.5	(16)	7.5	(5)
8	3,700	(4,300)	15.5	(17)	7.5	(5)
9	4,200	(4,900)	16.5	(18)	10	(5)
10	4,700	(5,500)	17.5	(19)	10	(7.5)

Economic Recovery of Pottery Glazes with Reduction of Dust—Rothmann [8] furnished an illustration of control measures which pay in recovery of material and in reduction in severity of exposures in the pottery industry.[8] Exposures to lead in the manufacturing of vitreous dinnerware has been lessened in recent years by improved housing, air sanitation, use of fritted glazes wherein the lead used is rendered relatively insoluble, such methods of housekeeping as vacuum cleaning in the "Dipping Room," and mechanized application of glaze.

A typical glaze formula shows 61 per cent silica and 11 per cent lead oxide. It is becoming more common to fuse some constituents of glaze into "frit" to add in ground-up form to the glaze. This renders the lead difficulty soluble. The frit (perhaps 31 per cent flint) may constitute a third of the glaze. A typical glaze showed 28.5 per cent white lead. A wet ball mill produces from the constituents a fluid into which ware is hand dipped, dried, and handled before firing. Exposures are being reduced still more recently by glazing with the aid of automatic equipment in mechanically exhausted booths. These machines were studied to compare their hygienic operation with the hand methods. Samples for lead determinations were sent to Dr. Lawrence Fairhall of the U. S. Public Health Service.

In the new booths, glaze is sprayed by pressure jets against ware on a conveyor belt. Exhaust ventilation removes the mist to bag filters for recovery. For over a year maintenance cost has been insignificant and the usual shaking of bags has been sufficient to clean them.

An arrester unit studied weighed

8,500 lbs., occupied 1,445 cu. ft., had a free cloth area of 1,920 sq. ft., required a 7.5 H.P. motor, static pressure 5.4" water, velocity pressure 1.2" water, air 4,200 c.f.m., spray booth openings (both booths) 10.5 sq. ft., 400 f.p.m. air velocity at opening. Glaze recovered, 7.0 lbs. per hr., would be worth about $610 per year if unit ran 40 hrs. per week.

Seven to 12 dust samples for each of three conditions of glazing showed for hand dipping, no ventilation, 7.4 million particles per c.f., ave., and 35.0 max.; for spraying without exhaust ventilation 28.3 m.p.p. c.f., ave., and 107 max.; for spraying with exhaust ventilation 3.5 m.p., ave., and 7.1 max. A run to show efficiency of collector system showed 1.2 m.p. at breathing level of booth attendant, 115 m.p. inside duct above booth, 114 m.p. near inlet to cloth filter and 1.5 m.p. in exhaust stack from filter.

Lead exposures in mg. per 10 cu. m. were found to be 1.2 for "hand dipping," 6.8 for "removing hollow ware from mangle" (excess glaze rubbed off), 167 for occasional "frit making, hand shoveling," 18.7 for loading ball mill, 12.7 for loading rotary frit furnace, and 4.4 for spray machine operation. Two to 9 samples in each of these cases did not vary greatly from the mean except in the last (0.7 min. to 65.0 max.) where performance of exhaust and size of ware were the important factors.

Reduction of Dustiness—Through Boyce [9] a contribution from Nichols [10] on practical reduction of dusty conditions found during the conduct of the Kansas program covered, (a) the recommendation that granite and monument concerns utilize dust filters on sandblast exhausts which were usually found to discharge so close to buildings as to re-contaminate the enclosures. From one installation it was estimated that these should cost from $30 to $40 with negligible upkeep; (b) correction of a hazardous condition studied at a smelting and mining company where three pigments, leaded zinc oxide, zinc sulfate, and lithopone are made from lead and zinc sulfide ores. Slag from roasting the ores is crushed to cinder for roadbed ballast. During shovelling of slag the dust count revealed 18 m.p. per c.f. (70 per cent free silica). A rather simple procedure of wetting kept down a large amount of this dust, and after being recommended to the company, was followed.

Alteration of Essential Process—McCord [11] furnished an informative example of substitution of a non-dusty for a dusty process.

In offset printing, it is common practice to spray on each freshly printed sheet of paper a suspension of gum tragacanth, gum arabic, or starch in alcohol as an anti-smearing agent. The atmosphere becomes charged with gum arabic dust, gum tragacanth dust, etc. The can containing the mixture is placed 3' or 4' above the receiving rack on the press. With the arrival of each sheet automatically the valve on the can is tripped, and air pressure blows the gum mixture into the air and on to the sheet.

Due to exposure to this dust, and particularly gum arabic, a number of printers in divers shops developed asthma and whenever again exposed presented asthmatic manifestations.

It has proved practical to eliminate the sprays and to substitute a series of minute gas flames. This apparatus may be made by introducing a number of gas tips into a sufficient pipe length and affixing this with an automatic control to play flames upon the undried sheet for an instant without charring the paper or changing the color of the ink.

Conveying Collected Dust in Exhaust Systems—Hatch [12] prepared the following description of practical elements of design:

Dust captured at exhaust hoods is commonly conveyed to a central collector located some distance from the dust producing operations. The air stream itself is used to transport the dust, and for coarse materials and heavy concentrations high velocities are required. The most common pipe velocity is 4,000 f.p.m.

High pipe velocities are objectionable for several reasons:

1. The power consumption and operating cost are high.
2. The abrasion of elbows and pipes is rapid and maintenance therefore troublesome and expensive.
3. A careful balance of the system is required in order to insure proper distribution of the air flow and adequate transporting velocities at all points.

This balance is upset when any departures are made from the layout established in the original design. In addition to these disadvantages one must point out further that even a high velocity becomes inadequate if the material is wet or greasy. Thus it is difficult and expensive to obtain continuous operation of a dust exhaust system without plugging the exhaust mains with dust.

To obviate these difficulties hoods should be designed so far as possible to prevent the removal into the exhaust system of coarse material and the piping located so as to reduce to a minimum horizontal runs of pipe. If a header pipe is required in order to accommodate the several branch pipes, recent practice indicates that the header may be of large cross-sectional area, thus reducing the velocity to a low figure to insure a constant settling of material in the header. A chain drag or other suitable means must be provided to convey the settled dust to a suitable storage chamber. For a compact grouping of machines the low velocity header may take the form of a settling chamber with a hopper bottom for direct discharge of the dust without further conveying. Because of the negligible resistance in the low velocity header a balanced system is insured without regard to the location of the branches or change in location from the original layout. Connection to the fan and the dust arrester required for the fine material which escapes settlement may be made at any convenient point on the low velocity header.

The cost of mechanical conveying is high, and the main header of large cross-section is also costly, but against these one may credit:

1. Reduced power consumption
2. Abrasion of pipes and elbows eliminated
3. A balanced system insured

Mechanical conveying has been used in exhaust systems in connection with woodworking machinery for several years, and is attracting considerable attention at the present time with respect to other types of dust. Installations which have come to the writer's attention recently included grinding and shaping machines for porcelain insulators, truing machines in abrasive wheel manufacture, dust control in cement manufacture, and crushing, screening, and conveying ore. The success obtained with these systems indicates this method of design will be used more in the future.

Extensive Alterations to Eliminate Lead Poisoning—Stratton [13] outlined a case in which a concern spent $25,000 to eliminate excessive exposure to lead dust of 200 persons among whom a number of serious lead cases had developed. Cast iron parts were enameled. A tunnel firing kiln used natural gas. The waste gases from the kiln fed the driers through which the sprayed parts passed on conveyers. Pumping the hot gases from the driers back into the spray hoods more than offset the total ventilation of the building through the spray hoods and other means. Lead dust was distributed throughout the premises.

A study was made, and through changes in fan capacity, duct diameters, and the installation of air curtains at spray booth openings, the amount of lead dust in air was reduced to a point of safety. Intensive medical and hygienic control of employees was maintained until constant checks of ventilation performance showed that they could work safely entirely unhampered, which convenience, together with the improved conditions, has probably more than repaid the expense.

Elimination of Plumbing Hazards—Connolly [14] described examples of a common type of lurking exposure not likely to be considered by industrial hygienists unfamiliar with other branches of public health engineering.

A water pipe was found with its end submerged in a silver-plating tank

in a manner to make possible siphonage of potassium cyanide into the drinking water lines of the building if the supply pressure should fall below atmospheric pressure. Since these pressure drops are not rare, it was fortunate that this connection was changed to break any possible siphonage train before a combination of circumstances poisoned several hundred persons.

Continuity of connection was also ordered broken, in factories where water was circulated through water-cooled jackets and condensing coils of degreasers and terminated in pipes submerged in sewers, slop tanks, or vats containing various solutions.

Dust Reduction by Installation of Machinery—Pincus [15] asked that a description of an accomplishment by their sanitary bureau be prepared by Tobias [16] to illustrate the elimination of a dust exposure and possible silicosis exposure among 600 employees, of whom 12 sandpapered book edges by hand.

Dust was practically eliminated and 10 employees were released to another department by the installation of Paper Cutter, Model 265, of the Challenge Mach. Co., Grand Haven, Mich.,* capacity 1,500 books per 7 hrs., knife cut 26", materials: old books to be renovated, stand operated with 2 employees at about $4.50 each per day, cost 3.5 cents per book.

* N.Y.C. Distributor: E. P. Lawson Co., 424 W. 33rd St.

DISCUSSERS

1. Albert S. Gray, M.D., F.A.P.H.A., Director; and
2. Benjamin F. Postman, Industrial Hygiene Engineer, Bureau of Occupational Diseases, State Department of Health, Hartford, Conn.
3. J. B. Lamenzo, Research Engineer, Hartford Accident and Indemnity Company, Hartford, Conn.
4. S. W. Gurney, Research Engineer, Liberty Mutual Insurance Company, Boston, Mass.
5. Wilmer H. Schulze, Director, Bureau of Environmental Hygiene, City of Baltimore Health Department, Baltimore, Md.
6. Manfred Bowditch, Director; and
7. W. C. L. Hemeon, Engineer; Division of Occupational Hygiene, State Department of Labor and Industries, Boston, Mass.
8. S. C. Rothmann, Industrial Hygiene Engineer, West Virginia State Compensation Commission.

S. C. Rothmann. Subsequently amplified in *Indust. Med.*, 8, 1:8–12 (Jan.), 1939, q.v. Example of installation.

9. Earnest Boyce, F.A.P.H.A., Director and Chief Engineer; and
10. Arthur L. Nichols, Industrial Hygienist, Division of Sanitation, State Board of Health, Lawrence, Kans.
11. Carey P. McCord, M.D., F.A.P.H.A., Director, Bureau of Industrial Hygiene, State Department of Health, Detroit, Mich.
12. Theodore Hatch, Associate Dust Control Engineer, Division of Industrial Hygiene, State Department of Labor, New York, N. Y.
13. R. C. Stratton, Supervising Chemical Engineer, Travelers Insurance Company, Hartford, Conn.
14. Joel I. Connolly, F.A.P.H.A., Assistant to President, Chicago Board of Health, Chicago, Ill.
15. Sol Pincus, F.A.P.H.A., Deputy Commissioner of Health, City of New York, New York, N. Y.
16. Leo Tobias, M.D., Industrial Medical Inspector, Department of Health, City of New York, New York, N. Y.

Cost Accounting*

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IN the administration of public health there are certain fundamental business principles which must be applied for the proper conduct of affairs.

In business and industry, particularly where the number of stockholders is large, there always exists a demand for accuracy as well as a desire for standardization of financial statements. Bankers loaning money to private business and corporations, and investment institutions arranging for new finances, have emphatically encouraged this trend. All parties concerned have recognized the value of having such statements audited by disinterested parties. The result of this has been the development of specialists, of properly accredited and trained accountants, engineers, and appraisers who play an active rôle in the interpretation of the component parts of financial statements in accordance with established procedures, with the ultimate result that accurate reports reflecting conditions are made in such a manner that their meaning is entirely clear—clear not only to the directors of the corporation and the bankers but to the rank and file of stockholders as well.

The business of public health is not a private undertaking without outside capital. It is administered with the funds levied on numerous taxpayers who, as stockholders, have come to expect clear and concise statements on the expenditure of their tax dollar, just as they do from industry. As in business, the taxpayer finances accredited and trained personnel to the measure in which his confidence in that personnel is maintained. The taxpayer who holds his "stock" in public service and the one who is taking stock of public service is entitled to periodic, understandable statements and balance sheets. Further, the taxpayer-stockholder has recognized the value of having such statements audited and appraised by disinterested parties, but in many instances he is still in a quandary in so far as public health cost statements are concerned. He is deeply conscious that nomenclature is not as yet standardized and that per capita cost does not always necessarily mean per capita cost. He knows that there is quite a difference in degree of services performed that needs to be clarified so as to make public health cost comparisons really possible. He knows, for instance, that in one city the school health work is done by the health department as a regular activity of that department while in another city there may be a school health department maintained by a separate budget. He knows that in another city private or outside subsidy, such as Parent Teachers Associations, Visiting Nurses Associations, and tuberculosis associations, or a county charities department provide certain services

* Read before the Health Officers Section of the American Public Health Association at the Sixty-seventh Annual Meeting in Kansas City, Mo., October 28, 1938.

that must be performed by health departments in other cities not so fortunate with subsidies.

Many taxpayer-stockholders look to detailed "functional cost" for comparison rather than to "per capita cost." They have learned that functional cost is truly comparable only within a city, or within a county, because different cities and different counties vary in their conception or need of the functions sometimes compared. There is also a variance in local problems. Per capita costs ignore the need for increased functional activity in one area that is nonessential in another. For instance, tuberculosis control can be an important essential function in one area while in another it is of relatively little importance because of the freedom of influx of such cases. The same is true of health education. The taxpayer knows that there exists a vast amount of room for improvement on standard nomenclature as applied to functions performed in public health and that until nomenclature becomes more definitely standardized truly intelligent comparisons are an impossibility.

The Los Angeles County Health Department, with due consideration of the American Public Health Association's *Appraisal Form,* has developed a nomenclature to meet requirements of the Los Angeles County Health Department in its activities with 38 contract cities and a large unincorporated area. The code may not be regarded as the acme of perfection but it is definitely an index to the possibilities of a functional cost code for large cities or decentralized areas served from "health districts" or "health centers" which are in turn responsible to a central bureau of administration.

The code surely has served us well in those days when we were required to make detailed functional cost reports to those 38 cities and it has served us as an administrative tool with bureau directors and district health officers. It is true that the code is now undergoing study for possible revision as a result of simplification of cost reports to cities made possible by a recent change in the California State Law whereby cities availing themselves of public health services from the county pay only for the services that are performed in the enforcement of local ordinances. This means that in so far as the contract cities are concerned they will require from us reports only as affecting enforcement of local ordinances and not pertaining to the various activities carried on by the health department under authority from the State Health Law.

The development of our "functional work number code" and the use of it will be interesting: Prior to 1917 the County of Los Angeles operated on a cash basis and although this means that the county did have some form of budgetary control it was not the effective control now exercised. The report of health department expenditures for 1916–17 reads simply:

Salaries	$ 8,456.41
Other Expense	5,592.09
Outlay	340.77
	$14,389.27

The following year expenditures were $14,506.14 for Salaries; $7,077.12 for Other Expense; and $1,572.80 for Outlay, or a total of $23,156.06. This total, however, was expanded in detail to list seven functions, namely: Health Office, Administration, Conservation of Child Life, Treatment and Prevention of Communicable Disease; Food Registration and Inspection; Sanitary Inspection; and Suppression and Control of Venereal Disease. That year was really the beginning of our attempt at functional cost segregation.

In 1915 the County Health Department was housed in a single room tucked away in a relatively unused por-

tion of the erstwhile County Courthouse attic. Inasmuch as the staff consisted of but one man, Dr. J. L. Pomeroy, there were no complexities of organization. Functional cost keeping was not yet a problem. Control in communicable diseases over an area of mountain, desert, and valley covering 4,085 square miles was more than enough for one man (even if he did have a trusty or trustless Model X). Serving that large area presented problems enough without dwelling on cost accounting. Reports indicate that a considerable showing was made during that year and that the Board of Supervisors allowed the Health Department $15,000 and augmented the force to include one inspector and one nurse.

As mentioned, budget control was installed in 1917 and the Health Department, still growing, was awarded about $18,000. By 1919 effective demonstrations had been made, notably in the suppression of a typhoid epidemic, and those sound practices inaugurated by Dr. J. L. Pomeroy resulted in the signing of contracts for public health by two cities, namely, Pomona and La Verne. By 1922 Glendora, El Segundo, and El Monte sought contracts. The following year Alhambra, Hawthorne, Monrovia, and Whittier signed contracts. In 1927, 26 cities were under contract and the following year 6 more were served. In something like 12 years the department had grown from a budget appropriation of approximately $15,000 to approximately $1,000,000.

To cope with rapidly increasing needs for the accumulation of definite statistical data which were required for administrative purposes for reports to contract cities and for state and federal agencies, mechanical tabulations of information on births, deaths, morbidity, inspections, home visits, etc., were provided with the introduction of a punch card, mechanical sorter, and tabulator, and when the various Mayors and City Councilmen became cost conscious, as a result of changing contract rates, clauses were inserted in the contracts requiring periodic functional cost reports as well as statistical reports covering the various activities within their respective boundaries. Naturally, the cities were interested in seeing just how much service they were paying for, and exactly what those services cost.

The punch card system was then extended to take care of the recording of time and mileage on the same card that was used to collect statistical data. This work number code, devised by Dr. Pomeroy, was put into use and with modification or addition has been in service for more than 10 years. The value of the accumulation of functional cost data is exemplified in that such functional cost data served the department at periodic contract periods to increase the revenue of the health department from such contract cities and specifically that revenue was increased during the 10 year period of 1926–1936 from $40,000 to $102,000. This money, incidentally, did not accrue to the Health Department budget but was deposited to the credit of the County's General Fund.

The compiling of functional cost data also has served in the preparation and fortification of budget requests which have passed the scrutiny of the Department of Budget and Research, which is charged with the examination of each item requested, and enables us to present in graphic form certain data not readily obtainable otherwise. Often, we have reduced results to a single chart, and in one notable instance not so long ago a single chart played a tremendous part in "selling" a tuberculosis program.

The same cost consciousness that is manifested by the city fathers, the research workers of the Department of Budget and Research, is shared by the taxpayer-stockholder, as exemplified at

various hearings of taxpayer's associations when the budget is considered by the Board of Supervisors. The value of accumulative history of functional cost over a period of years is therefore clearly evident.

Briefly, the main headings of the functional code used are as follows:

BUREAU OF GENERAL ADMINISTRATION

10 *Health Officer*
Used by Bureau Directors and District Health Officers representing Department as a whole

11 *Executive*
11.01 Secretarial and Personnel
11.02 Business Management
11.03 Special Work Annual Reports
11.04 Research Work
All administrative research assigned by Health Officer or Business Manager

12 *Accounting*
12.01 Accounts
12.02 Records and Statistics
12.03 Unit Costs—Population data, etc. Cost Section

13 *General Popular Health Information*
13.01 Press Work
13.02 Health News and Bulletins
13.03 Motion Pictures
13.04 Exhibits and Demonstrations
13.05 Lectures and Talks

14 *Employee Training*

15. *Vital Statistics*

18 *Maintenance*
18.01 Storeroom
18.02 Delivery Service
18.03 Special Assignment
18.04 Salvage
18.05 Service of Repair
18.06 Ditto Copy Work
18.07 Mimeograph Copy Work

Medical & Social Service, Maternal & Child Hygiene, Sanitation, Communicable Disease Control, Laboratories, etc., all have their major code numbers with sub-numbers covering such other breakdowns as it was deemed advisable to make.

As to material and supplies, the County Health Department added in 1932 a classification of supplies for material control ledger and code numbers were assigned to the various items used by the department. This classification was also used through the operation of the mechanical tabulating equipment. Perpetual inventory figures are readily accessible and assure the reasonably prompt preparation of reports as needed. Further, we know at all times the actual money value of our store stock.

The punch card system has been decidedly useful in the accumulation of billing data in conjunction with interdepartmental services to other departments. These services amounted to over $56,000 during the fiscal year just ended, which accruals are deposited with the County Treasurer and not to the credit of the Health Department Fund. Under the existing arrangement the County Health Department acts as custodian for several county buildings in which others beside the County Health Department offices are located and detailed billing information available to the various departments served must be maintained.

Any license or tax fees collected as a result of public health services do not accrue to the Health Department Fund but are deposited with the County Treasurer as miscellaneous receipts and accrue to the General Fund of the County. As to the cost of cost accounting, particularly with municipal, county, or state departments, it is clearly evident that no definite comparison with other cities, other counties, or other states can be made when we take into consideration the fact that one city may be able to operate under a very liberal setup which permits expediting the handling of claims whereas other cities or counties are definitely held by rigid charter provisions put into force under conditions less modern than the present and continuing with the ramification of detail which cannot be eliminated except by revision of charter provisions or changes in rules ordinances which govern in certain cities and counties.

We do not propose to answer the possible question as to whether or not a punch card system of mechanical tabulation is entirely practical for a health department, considering mechanical tabulating and sorting for functional cost data alone. Volume can best determine that. For statistical tabulations, however, the mechanical setup provides unquestionable flexibility. Our own volume of statistical data required is such that we believe we have reached the bottleneck point where, in order to render coincidental reports on cost and statistics, we must either enlarge our present mechanical setup to permit more epidemiological studies, more spot checks, more studies of birth and death records, more complete information on tuberculosis, and more statistical information on venereal disease control, or use our present equipment entirely for statistical purposes. With the assistance of the County Auditor, we are experimenting with a system which indicates a promise to liberate mechanical tabulating time to statistical information and to separate time and mileage from such statistical reports. We are not prepared to make a prognosis and the next few months probably will tell the story.

In conclusion, we should like to stress again the point that a concerted effort is needed to bring about the standardization of functional terms used in connection with public health departments and thus so clarify the situation as to make comparisons truly possible.

DISCUSSION

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DR. POMEROY, Mr. Messier, and their associates at the Los Angeles County Health Department have built up a very excellent means of cost accounting. It seems obvious that the establishment of such a service is of value in the reallocation of costs to various localities which purchase their public health service from a central organization. There should be an increasing tendency for suburban communities either to pool their health work through a common agency, county or district, or purchase the same from some nearby urban center. In either event the need of reapportionment of costs is evident.

In Los Angeles County both the extensive area involved and the multiplicity of organized communities warrant the adoption of the plan whereby the services are pooled under the auspices of a county unit. In suburban communities which cluster about a large metropolis the control of milk, food, sanitation, and even communicable diseases by the city may serve to a liberal extent the needs of the surrounding territory. Surely, it would not be unfair to apportion some of this cost back to the suburban taxpayers. To do so requires the installation of a cost accounting system.

In the sanitating of food, milk, and other beverages a health department provides service not only for the consuming public but also for the industries, food handling establishments, pasteurizing plants, and packing houses concerned with such problem. In apportioning the cost of inspection the broad attitude may be taken that the suppression of disease is in the interest of the public good. The cost must in

the final analysis be borne by the public. The actual bill for the service may, however, be presented to the consumer either as a taxpaying citizen or through his milk and meat bill. We, personally, feel that from the administrative viewpoint of the health department there is some advantage in establishing licensing fees sufficiently high to meet a good share of the inspectorial expense. After all, the practical health administrator knows that there is a reasonable limit beyond which public funds will not be appropriated for the health department. It behooves us then to use our ingenuity in transferring from our tax budget to some other source those expenses which can be reasonably borne elsewhere.

There are many activities which have a complete or partial health significance which can be shared with other city departments or with industry and business. Plumbing and smoke inspection, as well as traffic control, all have their health significance, but if we can impose upon a building department and police department the expense involved in engaging the services of inspectors and policemen, it reserves to the health department, funds with which to employ nurses and health educators. We must conduct our health programs with maximum service in adventures which contribute most directly to reductions in death rate, prolongation of human life, and an increased fullness and wholesomeness of man's existence. In sharing with others, by the official or nonofficial, public or individual agencies, we need some reasonable form of cost accounting. The consumer, the businessman, and the public demand this type of bookkeeping.

Financial interpretation of health procedures affords also an opportunity for the alert health officer to compare his own program in point of time and that of others in both time and place. As the years roll by we should be interested in knowing whether our departments are becoming more efficient and whether the cost of a nursing visit or an inspection is going up or down. If it is too high in light of previous years or too high when compared with similar conditions in some other city or county, let this serve as a warning note that the service needs investigation. The whole process should serve toward the more efficient conduct of public affairs.

Finally, let us not forget that the modern health department is built upon public confidence, that the citizens support a health department because of their personal interest in the avoidance of conditions which are inimical to health. Public funds would soon dry up and health departments would be stranded were it not for some systematic reporting to the taxpayer of the value received from the tax dollar. Those who have taken an interest in this type of health bookkeeping are to be congratulated. Let us hope that their example will be followed by many others.

Essentials of Budgeting*

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ACTIVITIES of health departments are expanding rapidly, in consequence of popular demand and increased appropriations. Almost universally, appropriations are requested in budget form, and accounting procedures are based on the accountability of funds allotted under budgets. The budget record is probably the one form which is used in common by all health departments, large and small, and operating in states, counties, and cities. So the budget is the most important financial document in the department. And, since all activities cost money and, therefore, have a financial basis, it can be said that the budget is one of the most important instruments in the entire department. It is timely, therefore, that at this meeting of the Health Officers Section, where business administration subjects are discussed for the first time, that "The Budget" should be given prior consideration.

The subject will be developed under the 4 following general heads:

1. Budget Planning
2. Budget Building
3. Budget Accounting
4. Budget Control

BUDGET PLANNING

Budget making begins with *planning*. The *financial* budget is the device for making effective the *work* budget. The budget is the *effect* not the cause. Budget making time should be an inventory taking time. Existing activities should be critically reviewed and evaluated. Results should be compared with costs, and determination made for contraction, continuation on the same basis or expansion of existing activities. Constant repetition of duties is apt to establish their necessity in the minds of the workers. Just because something has always been done is no reason, *per se*, for its continuance. A tradition may become sacred solely by reason of its age. It is desirable, therefore, that the public health administrator critically examine the activities of his department at budget making time, and seek continued support of only those which have made definite contribution to the main objectives of public health work. Having made this important determination, it then becomes necessary to consider the extent, if any, to which present activities should be extended and what new activities should be inaugurated. Pressure for new activities in public health work frequently originates from the lay public and careful consideration should be given to such suggested projects, to determine their soundness as governmental procedures and their position or relation to functional units in the organization. Of course, new activities will also be suggested by our own experience or that of others, and by scientific research and discoveries.

In this connection I quote from an article by Dr. C. E. Waller, Assistant

* Read before the Health Officers Section of the American Public Health Association at the Sixty-seventh Annual Meeting in Kansas City, Mo., October 28, 1938.

Surgeon General, U. S. Public Health Service.[1]

Sound planning is essential to the success of any public health undertaking. It is unscientific and wasteful to attempt the setting up of facilities for health work without first determining what the most important needs of the community may be, and how each dollar available to the health organization may be expended in such manner that the greatest possible return on the investment may be obtained. Too often the development of administrative machinery and procedure has simply followed the lines of a pattern borrowed from some other community, or, even worse, has been based upon expediency. Any plan designed to meet the health needs of a particular state, city, or county should be formulated only after careful study has been given to all available data relating to local health conditions, including morbidity and mortality records, and after the most important problems have been determined. It is well to bear in mind, in this connection that some of the activities usually carried on by health departments, while popular, and desirable from the esthetic standpoint may be relatively of little value in actually preventing disease. When funds are limited, the facilities required to meet the most important needs from the standpoint of reducing preventable illness and mortality should come first; after these have been provided, other activities may be undertaken, but the public should be informed very frankly that some of them are desirable chiefly for esthetic reasons or for the sake of comfort, and play only a small part in protection of the public health. Such activities should be afforded to the extent that the people are willing to pay for them after funds have been made available to meet the real and urgent public health needs of the community.

We must also consider, in selecting health activities to be supported with public funds, the question as to whether the proposed expenditure for a given project is sound from an economic standpoint. It is conceivable that in some communities the performance of certain functions, admittedly of some value in preventing disease, might not be economically profitable because of the relative unimportance of the problem and, consequently, the relatively small return for the expenditure. Those of us who have the responsibility for the administration of public funds should have the courage to face the facts and to be fair with the public.

Determination having been made concerning our activities or *work* budget for the ensuing period, it then becomes necessary to support that program with a *financial* budget.

This leads us to a consideration of the second phase of budget making, namely, budget building.

BUDGET BUILDING

In compiling the budget, it is necessary, of course, to follow the form provided for all agencies of that government of which the health department is a part.

The form varies in the several states, counties, and cities. This renders somewhat difficult the comparison of health department budgets. It may be possible for this group to work toward a standardized terminology of items so that health department budgets can be more accurately compared. In many of the states, counties, and cities using the budget system, a standard classification of expenditures has been adopted. This differs considerably in the various political units, some classifications being very detailed, others comparatively simple. In general it is believed the system described below fairly meets the needs. Only that part of the classification relating to health department operation is discussed. The plan is effective in several of the states, and has stood the test of usage over a period of several years. Under this plan the classifications governing the preparation of the budget require the estimates to be furnished under the two general classifications: by character of expenditure; by object of expenditure.

Classification by character of expenditure means the division of the estimates in the budget so as to distinguish between current expenses, or those which are incident to operation, and those which are capital outlays. Requests for funds for each activity

are made under one or the other of two heads—"expenses of operation" or "capital outlays."

"Expenses of operation" embrace all items of expenditure necessarily incurred for current administration, operation and maintenance, and those for materials and equipment in the nature of repairs or replacements which do not add to capital assets.

"Capital outlays" comprise expenditures of every character which increase capital assets by additions or betterments. Extensive or extraordinary repairs and replacements in kind do not constitute "capital outlays" where no change has been effected in the kind of equipment, or structure.

Following the primary separation of the estimates for each distinct activity into "expenses of operation" and "capital outlays," the items which fall under each head are arranged by *object* of expenditure—or, to express it differently, by kind of things purchased—in accordance with the following general classification, which is uniform for all activities.

EXPENSES OF OPERATION

A. Personal Service

Personal service is direct labor of persons.

Salaries

Salaries to include compensation of all regular officers and employees who are paid at a weekly, monthly or yearly rate.

Wages

Wages to include compensation of all regular employees who are paid at an hourly or daily rate.

Special Payments

Special payments to include all fees paid for special services.

B. Supplies

Supplies are commodities of a consumable nature which show a material change in, or an appreciable impairment of, their physical condition through use; and instruments and tools which have a limited period of use and are liable to loss, theft, and rapid depreciation.

Operating Expenses

Fuel supplies
Office supplies and stationery
Printing
Medical and surgical supplies
Laboratory supplies
Household, laundry, and cleaning supplies
Motor vehicle supplies and operation
Books and periodicals
Engineering supplies
Vaccines and antitoxins
V. D. Clinic supplies
Other supplies

C. Repairs and Replacements

Includes the cost of labor and services of other than employees, materials, use of equipment, etc., all of which may be necessary to maintain in kind equipment and property.

D. Other Expenses of Operation

Light, heat, power, and water
Traveling
Transportation of commodities
Communication — telephone, telegraph, postage, etc.
Insurance
Other Expenses

E. Capital Outlays: Betterments

Equipment, land and structures (additions)

Equipment, consists of machinery, implements, tools, furniture, live stock, vehicles and other apparatus that may be used repeatedly without material impairment of their physical condition and which have a calculable period of service, including additions or betterments to existing equipment.

According to A. E. Buck in his book *Public Budgeting* [2]:

The systematic classification of governmental expenditures and income is a recent achievement in this country. Perhaps the first comprehensive attempt at any such classification was that made by the U. S. Bureau of the Census when it began the collection and publication of the Financial Statistics of Cities under an act of Congress which was passed March 6, 1902. Under this classification, expenditures were grouped on both functional and character bases and income (revenue) was arranged according to sources. The same types of classification were applied to the Financial Statistics of States when this series was started by the Bureau of the Census in 1915.

The next important development in classification came as a result of the work of the New York Bureau of Municipal Research in connection with the installation of budgetary procedure in New York City. This work began in the city department of health in 1908, and during the subsequent five or six years practically all the departments and

agencies of the city government were studied. The proposals for classification were confined to expenditures. At first, the emphasis was placed on a functional classification within departments supplemented by an object classification. Within a short time, however, the emphasis was shifted to the object basis. The reason for this, as later explained, was that classification by object lends itself to standardization of accounting procedure, while grouping on the basis of function seems to increase the difficulties, inasmuch as the functions must differ in every department. Accountants naturally preferred the form of classification that promised greater uniformity and order in the account. It was possible to standardize the classification by objects but not the functional one. Besides, appropriations by functions would leave the door open for the misuse of funds, unless supported by an intricate system of accounts; while appropriations by objects would apparently check this practice, which was regarded as one of the most trying evils of that period. For these reasons the functional classification was gradually subordinated and the classification by objects became the primary one in all the city departments by 1912.

Having decided on the *work* budget and drawn the pattern for the *financial* budget, it now becomes necessary to determine the amounts to be asked for in the various items. In the personal service division of the budget, the amounts asked for individual salaries should again be the result of careful planning. It is presumed that job studies have been made from time to time to determine, among other things, the load and the production per worker, and the relationship of the duties to be performed. Useful also, is some device or measure to determine and record the efficiency of employees in their respective jobs. With this information and background, it is now possible to fix the amounts of individual salaries. Involved in all this, of course, are certain aspects of personnel administration, and it is to be presumed that in the selection of employees, job classifications have been established, and duties of each position and qualifications of persons holding the same have been defined. It is also to be presumed that proper tests have been applied to individuals seeking employment to determine their fitness. If the department operates under civil service, these procedures almost surely will be in effect. In this connection, it can be said that while there are some objections to the operation of civil service systems, particularly in the employment of professional and technical personnel, the desirable features distinctly outweigh the undesirable ones. Security of employment enlists the interest of qualified personnel, and emphasis is placed on job classification, definition of duties and qualifications, and orderly and impartial testing of applicants for positions to determine their fitness. This makes for good personnel administration.

Budget building will be greatly simplified if there is in effect a standardized scale of salaries. Like salaries should be paid for like duties and *performance*. It is desirable to have a range in each classification, and, generally speaking, new employees should enter the service at the minimum rate and be advanced as their efficiency increases.

It is customary to have a differential of from 20 per cent to 30 per cent between minimum and maximum salaries within the various classifications, and to establish yearly increments so that the maximum is reached in five years. Some salary standardization plans provide an additional amount above the maximum as a bonus, for extraordinary or unusually efficient service.

All of these features of good personnel administration can be adopted by any department, irrespective of whether or not the political unit under which it operates uses the merit system.

With these administrative procedures in effect, the fixing of the amounts of the individual salaries in the budget becomes a simple matter. It is for this reason that it can be said that

the salary budget is the result of an orderly and planned approach to the important matter of compensation. We are dependent upon others to do the routine work of our departments. Good morale is not only important in the successful conduct of any organization, it is absolutely necessary. The payment of fair and just compensation in turn has a large effect on morale. Just as important is provision for a retirement system to insure some degree of economic security to those who have devoted their lives to this essential branch of public service. Public employees are of course exempt under the provisions of the Social Security Act, relating to Old Age Pensions, so it behooves us to work for the establishment of pension systems in our own political units.

In determining the amounts of the various expense items, both the past and the future must be explored. The past for experience in the consumption of the quantities of commodities or use of services which we have purchased. In this connection it is presumed that records of use of commodities have been maintained as an index of future consumption. Proper weight must, of course, be given to expected increase or decrease in consumption or use. Consumption and use having been determined it then becomes necessary to estimate the cost. Here we must explore the future, and forecast market conditions from past and present price trends, and other economic factors which affect the price structure.

Having fixed the individual budget items it is now possible to total salaries, to total expenses, and arrive at a grand total. These sub-totals should be critically reviewed for their relationship to each other and to the grand total; for there is a relationship between total salaries and total expenses and the grand total. For example, in Maryland we have found that total salaries should not exceed 74 per cent of the total budget and should not be less than 70 per cent. If too large a sum is set aside for personnel services we will have workers but no tools; if too large a sum is provided for expenses, we will have tools but no workers. So, it is necessary to keep the two main divisions of the budget in proper balance. This percentage relationship will be constant only for each political unit, and must be worked out by each department for its own use. State departments because of the large area in which they work, need a larger amount for expenses, particularly travel and communication, than counties and cities. Costs and convenience of travel and degree of decentralization of field work are other factors which affect the percentage relationship of budget subdivisions. This test should be applied to the budget sub-totals and adjustments made if necessary.

It is interesting to observe that 28 states report the relationship of subtotals for salaries and expenses to total budget to range from

35% for salaries and
65% " expenses
100%

to

81% for salaries and
19% " expenses
100%

The average for salaries is 61%
and for expenses is 39%

Seventeen of the larger cities report salaries totaling from

36% for salaries and
64% " expenses
100%

to

92% for salaries and
8% " expenses
100%

The average for salaries is 77%
and for expenses is 23%

Because of varying conditions and factors perhaps not much significance can be attached to these average figures.

The budget having now been completed and all the tests for a balanced document applied, it becomes necessary to prepare for its explanation and justification before budget making and appropriating authorities. In no one particular perhaps is the result of careful planning and proper building technic so forcibly illustrated as in the presentation of the budget. A haphazard or poorly organized affair is sure to bring discredit on the department, and little consideration from the authorities. By the same processes of planning and building we should be able to justify our budget to fiscal officers. Nothing so far has been said about cost accounting because that is the subject of another paper for presentation at this session. It is highly desirable to be familiar with the unit costs of operation, at least of the various functional units. If unit costs have in addition been developed for individual activities or processes, that information can be used to good advantage to justify the budget to fiscal and appropriating authorities.

BUDGET ACCOUNTING

We assume now that the budget has had the approval of budget making officials, has successfully run the gaunlet of appropriating authorities, and the funds are available. Activities of the department are proceeding and money is being expended. It now becomes necessary to account properly for such expenditures. It is not within the scope of this paper to describe complete accounting systems for health departments. But if funds are made available under a budget it is obviously necessary that a budgetary record be maintained. This is one of the accounting forms which doubtless all health departments operating under the budget system have in common.

A satisfactory form provides for the recording of encumbrances, expenditures, accretions in way of appropriated receipts, and, of course, shows the amount, account number, and title of the budget item. One sheet is used for every item. Accumulative totals of receipts are shown and accumulated expenditures and encumbrances, and finally net balances after each transaction.

This form can be used in connection with hand or machine bookkeeping. Appropriations are authorizations to spend, and this form provides a complete record of expenditures bringing together all the necessary information, including accretions to the various items, and showing unexpended and unobligated balances after every transaction.

Budgets must necessarily be prepared some time in advance of their date of operation and it is impossible to forecast exactly the correct amount of every item. As the budget period proceeds, some items will carry surpluses, others will indicate deficits. This is especially true of budgets for health departments, where unpredictable outbreaks of disease may throw the most carefully planned budget out of joint.

Provisions must therefore be made to amend the budget by adjustments between surpluses and deficits, in order to balance at the end of the period. Practice, of course, differs in various political units, and the procedure in effect must be followed. The important point is that flexibility in budgets must be provided if funds are to be used to the best advantage. It is also desirable to have a contingent fund, under outside official control if necessary, which will be available to meet actual emergencies, especially those arising from unusual outbreaks of disease. This fund

can be sufficiently safeguarded to prevent the possibility of the money being used except in absolute emergencies.

BUDGET CONTROL

As budget items are authorizations to spend, by that very factor expenditures must be limited to the amounts of the items. So that the budget appropriations become at once authority and restriction. Penalties are usually provided for over-expenditures, so it becomes necessary for the administrator to establish the machinery for control of expenditures. Without this device, the financial situation would soon become chaotic. Functional units should be allotted their own budgets; and obligations and disbursements carefully recorded against every item, so that *rates* of expenditure can be observed. Rates of expenditure have some importance but are not necessarily controlling. Seasonal activities, forward purchases of supplies in favorable markets, and other factors disjoint the rate of expenditure from the theoretical 1/12 of the annual appropriation per month. These disjointed rates however, tend to flatten out over a period of months, so that the trend of the rate can be established. By such safeguards, it should be possible to balance activities against resources and reach the end of the budgetary period with accounts balanced.

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2. Buck, A. E. *Public Budgeting*, pp. 177–178.

DISCUSSION

CLIFFORD C. SHORO

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MR. Kirkman has made it perfectly plain to all of us that there are two important preliminary steps to the completed budget. First "Budget Planning" and second "Budget Building." Then he carries his scheme to third, "Budget Accounting" and fourth, "Budget Control," and there he stops, and I am glad because he has so completely covered the subject that there is not much left for me to talk about. I might comment on the order in which he has placed the four subheadings into which he divided the subject, because it seems to me that "Budget Control" might precede "Budget Accounting."

But I really do believe that there is one important phase of "Essentials of Budgeting" that he has not brought out. I mean the philosophy of the fiscal officer in preparing his budget for submission to the appropriating authority.

You know that a *budget* is actually a financial plan of a governmental unit which covers not only appropriations to be requested but also ways of financing such proposed expenditures. Or, in other words, a budget is a plan of expenditures and income.

My philosophy of budget making can be summed up to this, "Budget only such items and in such amounts as can be defended before any individual, group, or committee by factual data." I have found that different methods are employed by health department and hospital officials in presenting their plans and budgets for consideration. However, I can safely say that all methods used can be classified under two

headings (1) the true or honest budget that can be defended to the last detail, and (2) the inflated or padded budget.

First, let me discuss the latter method of budgeting. Some officials feel that their budget must be prepared in such a way and in such amounts as will give room or opportunity for the appropriating authority to cut and slash and still provide sufficient funds on which to operate. They feel that this is the only safe method to use as it provides an opportunity for the official charged with the duty of making or recommending appropriations, be it the governor or legislature of a state, the mayor or board of aldermen of a city, or the board of supervisors of a county, to publish the budgets submitted as compared with the appropriations made or recommended calling particular attention to the savings made to the taxpayer.

I do not agree with this method.

I believe that the inclusion of "velvet" in a budget is sure to be detected and will result in the entire budget being viewed with suspicion and distrust. Such a budget is sure to be reduced and the fact that some items and amounts are absolutely necessary and essential will not deter the appropriating authority from arbitrarily reducing the entire budget.

I will stake my chances on a true and honest budget but will not jeopardize the operation of our department by the submission of an inflated budget.

If a new activity is worthy of consideration then it is worthy of sufficient study and planning so that a request for an appropriation with which to implement such activity can be properly defended and not subject to reduction on account of poorly estimated costs. If estimates of costs of maintaining a service or activity are carefully made and can be backed up with factual data or, in the absence of actual facts, can be reasonably and honestly compared with data of a comparable activity already under operation, then the decision to be reached before an appropriation is made can be based on only one consideration, namely, is it a necessary or essential activity which the governmental unit should undertake for the benefit of its citizens.

If it is proposed to extend or enlarge an activity already in operation then it becomes a comparatively simple matter first to determine the extent or volume of work to be done or services to be rendered and by comparison with the activity already under operation to determine the cost of the enlarged program.

We have considered the two opposite methods of preparing budgets for consideration.

There are other types of budgets that are submitted, possibly less frequently, but yet we do see them occasionally.

Take for instance a plan or program submitted by a division to be included in the departmental budget. Invariably the greatest amount of detail is given to explanation of the needs for the activity and the personnel with which to carry it on. If it is a field activity the plan will include the necessary field personnel, automobiles for transportation, items of maintenance and operation of cars, and hotel and other expenses of travel, and statistical, stenographic and clerical assistants in the office; but I wonder how many fiscal officers in checking such a plan have found that nothing has been included for the purchase of office furniture, typewriters, filing cases, etc. I once saw a budget that had been prepared calling for the expenditure of over $100,000 and in listing the personnel required, not one single position had been included to do the necessary auditing and accounting of this fund.

In his treatment of the subject under discussion, Mr. Kirkman has included Budget Accounting and Budget Control

as equally important as Budget Planning and Budget Building. In this I fully concur. It is accepted that the planning of the budget is the prerogative of the Chief Medical Officer. However, the building, control, and accounting of a budget should be the duty and responsibility of the fiscal officer, which brings me to the point that I want to make in connection with the relation between the chief health officer and his fiscal officer. Possibly this has no place in this discussion, but I have cited two examples of incomplete budgets simply to give me an opportunity to stress the fact that your fiscal officer should have as important a place in your official family as any other division head.

His should be the responsibility for the execution of a complete budget. His should be the authority for the proper and economical expenditure of all funds appropriated for the department for expenses of operation and his the responsibility for budget accounting. No budget should be prepared and submitted as a request for appropriations that has not been built by the fiscal officer on plans laid by the chief medical officer.

Likewise, no orders for the expenditure of funds appropriated under any of the several headings of Expenses of Operation should be issued by any department official other than the fiscal officer. Only in this way can the financial affairs of a health unit be properly conducted.

As an indication that health officers are coming to realize the assistance that a well trained fiscal officer would be to them I call your attention to what some speakers have said earlier in the week.

Dr. Mosher recommended the delegation of administrative authority by the health officers. Dr. Mountin called our attention to the average tenure of office of the health officer. Dr. Waller pointed out the probability of increase in federal appropriations and allotments to states for general public health work and for specific purposes. This had reference to the program that Dr. Parran so thoroughly explained. Dr. Bass said that a doctor has the reputation of being a poor business man. Dr. Williams made this statement: "fortunate indeed is the health officer who has a strong financial and budgeting secretary." Dr. Amyot in connection with his recommendation of a committee on finance, budgets, and business administration referred to it as the "life blood of the organization."

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WILLIAM HALLOCK PARK

THE death of Dr. Park on April 6 breaks one of the last remaining links with the Golden Age of Bacteriology. His 76 years spanned the entire history of the modern public health movement; and his personal experience, as the organizer of the first municipal diagnostic laboratory in the United States and as its active head from 1893 to 1936, is a unique record of achievement.

Dr. Park was born in 1863 and graduated from the college of the City of New York, taking his medical degree at Columbia in 1886. He studied at Vienna and began general practice in New York; but he brought with him from abroad the new vision of bacteriology and began, under Dr. T. M. Prudden's leadership, to experiment with the bacteriological diagnosis of diphtheria. Dr. Hermann M. Biggs, who had recently been appointed Chief of the Division of Pathology, Bacteriology, and Disinfection in the city Department of Health invited the youthful investigator to organize his projected laboratory. Park began service on May 4, 1893; and by the end of that calendar year he was able to make one of the most remarkable reports in the history of bacteriology. His first 8 months of study demonstrated: (1) the validity of the culture test as the only reliable criteria for the diagnosis of diphtheria; (2) the persistence of virulent diphtheria bacilli in the throats of convalescents; and (3) the importance of the well carrier in the transmission of this disease. The value of the latter contribution to the development of our understanding of the importance of the carrier state has never been appreciated at its full value.

During the next 4 years, Park and Biggs employed diphtheria antitoxin for the first time—on a large scale—for the treatment of diphtheria and completed the first statistical demonstration of its incalculable value. Later on, when active immunization against this disease became a possibility, it was again Park who took the lead in the development of toxin-antitoxin. His intimate connection with this field is indicated by the fact that our standard organism in all diphtheria studies is still "Park No. 8"; and it was truly said that Dr. Park

" contributed more than any other living man to the development of bacteriological diagnosis and serum treatment which has made possible the conquest of diphtheria."

Yet Dr. Park was no " one-disease man." In connection with the immunological prophylaxis or treatment of scarlet fever, of pneumonia, of tuberculosis, of pertussis, of meningitis, of poliomyelitis, his achievements are embedded in the permanent literature of medical science; and he played a notable part in the introduction of immunization by the use of convalescent serum in measles and other infections.

In the wider field of public health, Park conducted (with Dr. Emmett Holt) one of the first studies of the relation of milk to infant diarrhea. He added greatly to our knowledge of human infections with the bovine tuberculosis bacillus; and he was the outstanding figure in the development of methods for the bacteriological control of municipal milk supplies.

Dr. Park received well deserved honorary degrees from New York University, Queen's University, and Yale. He served as Professor of Bacteriology at University and Bellevue Hospitals and at the Medical College of New York University, and in 1933 was appointed as Hermann M. Biggs Professor of Preventive Medicine at the New York University and Bellevue Hospital Medical College. His texts, *Pathogenic Microörganisms* and *Public Health and Hygiene* have made his influence as a teacher nation-wide. Among the honors showered upon him have been the presidency of the American Public Health Association, the Society of American Bacteriologists and the Society of Experimental Pathologists. He received the Sedgwick Memorial Medal of the American Public Health Association, the Kober medal of the Association of American Physicians, the Public Welfare medal of the National Academy of Sciences, and the Townsend Harris medal from the College of the City of New York.

To attendants at the annual meetings of the A.P.H.A., Dr. Park was much more than a great figure in the history of bacteriology. To his staff in New York City, he was an inspiring, loyal, and affectionate chief. To many more of us, he was a wise critic, a sane counsellor, a modest, genial friend. We can agree with the citation made in connection with his honorary degree at Yale that here was " the perfect type of the scientist in the service of the State."

REVISING HISTORY

ONE of the most dramatic instances in medical history was the conquest of puerperal fever. Nothing arouses people more than such a terrible death rate as used to occur in childbirth—an entirely normal and physiological function of life. America was the scene of one of the bitterest controversies in which one party forgot the amenities of life. The other party to the controversy gave a " soft " answer in saying, " No man makes a quarrel with me over the counterpane that covers a mother, with her new-born infant at her breast." To Oliver Wendell Holmes we in America are accustomed to giving credit for the discovery that puerperal fever was a contagious disease and his article published in April, 1843, is one of the classics of medical literature. He said: " The disease known as Puerperal Fever is so far contagious as to be frequently carried from patient to patient by physicians and nurses." In Europe credit for the

discovery is usually given to Semmelweis. It is perfectly true that Semmelweis made observations and devised a system of prevention of childbed fever which was markedly successful. In May, 1847, he used "chlorina liquida" to wash his hands and required all of his students to do the same.

Now we have a story from Budapest * which seems to be thoroughly authenticated. In 1923, Professor Hauch, of the University in Copenhagen, claimed that the discoverer of the cause of puerperal fever was Pehr Gustav Cederschjöld. Professor György, of the Department of Medical History, University of Budapest, resolved to defend the claim of Semmelweis and undertook an extensive study which has ended in his giving the credit to Cederschjöld, who was born in Lidboholm, Sweden, in 1782. In 1817 he was appointed extraordinary professor of obstetrics and adjunct of the lying-in hospital Allmänna Barnbördshuset, founded in 1775.

Puerperal fever was common in the 18th and 19th centuries in the Scandinavian countries. At Allmänna Barnbördshuset the mortality for the first 2 years was 2 per cent while in 1777 it jumped to 19 per cent, though a new building had been moved into, and after that the disease was constantly present in the Institute. Cederschjöld pointed out that the fever was capable of assuming lasting epidemic character in large lying-in hospitals. He thought it was spread through the air by means of a volatile agent. He described the disease as assuming the picture of putrescence of the womb, but believed that the contagion clung to the nurse who carried it to healthy mothers on whom the same sponge or towel was used. He told of having seen almost all puerperal women treated by a certain midwife fall sick, so much so that he was forced to exclude her from the obstetrical wards, while the disease was practically absent from women attended by other midwives. Cederschjöld, acting on the belief that contagion was spread from the vulva, supplied every patient with a special sponge and towel. Almost immediately favorable results appeared. In 1826 he was allowed the use of three wards wholly separated from the lying-in institution, to be used exclusively for women with fever. They had separate nurses and midwives. A little later he mixed chlorine with the water with which the parts of women were washed. This account was given in 1839. Semmelweis's discovery was made in 1847.

Apparently Semmelweis did not know of Cederschjöld's work. It seems certain that Cederschjöld deserves a distinguished place in the long line of observations and studies which ended in the discovery of the cause of puerperal fever and its prevention.

According to the evidence, we must admit priority for Cederschjöld. Just as certainly, Holmes preceded Semmelweis in his understanding of the contagious character of the disease. It is evident that three great men each made a great discovery independently, and honor must be paid to each one of them for a notable service to humanity.

* Foreign Letters, Budapest. *J.A.M.A.*, Feb. 11, 1939.

GUARDING THE HEALTH OF VISITORS TO THE NEW YORK WORLD'S FAIR

THIS greatest of all World's Fairs, according to the publicity releases, is now open. It is estimated that 60 million people will visit it, including 500,000 from overseas. From every corner of the United States millions are expected

to pour in. Great numbers of people coming together act like a huge purse net bringing in any contagious diseases that may exist in the huge areas from which they come. This has been seen in fairs of this kind, in armies, and to a lesser extent in schools and colleges.

We are assured that every precaution has been taken, not only by the authorities of the Fair itself, but also by the health authorities of New York City. The City Department of Health has, in coöperation with the Fair Corporation, established a branch on the Fair grounds under the direction of Dr. John G. Grimley, Special Deputy Commissioner of Health. It is to deal with water supplies, plumbing, foods, milk supplies, the disposal of sewage, communicable diseases, and nuisances in general. Special regulations to strengthen the Sanitary Code of New York City have been passed with the special object of safeguarding the health of the vast influx of visitors. These will be carried out by a staff of 35 thoroughly trained inspectors who will daily visit the 600 eating and drinking establishments on the Fair grounds.

All food handlers are to be examined once a month and cards issued to them. No permit will be issued to any food establishment which does not meet the requirements of the World's Fair Special Sanitary Code as well as the Sanitary Code of the City of New York.

Sanitary regulations require that all glasses, crockery, and utensils used in the serving of food must be properly washed in a solution of soap, soda, or other cleansing powders and treated with a final rinse of hot water at 175° F. for a period of one minute.

Machinery has been devised for the disposal of the enormous amount of garbage which would otherwise accumulate. Specially constructed garbage trucks have been designed and each will be followed by another truck containing two tanks of 1,000 gallon capacity each carrying a cleansing fluid.

Under the Fair Corporation, Dr. J. Peter Hoguet, Medical Director of the Fair, will be in charge of a comprehensive program. Two years of study have been given to the plans and it is felt that persons may come to the Fair with every assurance of protection against disease as well as of care in the event of accident or disease. A staff of 24 doctors and 30 nurses will be in attendance constantly. The Fair personnel of more than 5,000 has been vaccinated against smallpox.

There are 7 first aid stations, each with a waiting room, rooms for the doctors and nurses, and wards for men and women. Serious cases will be hospitalized temporarily on the grounds and transferred by ambulance to outside hospitals as soon as possible. Five air conditioned ambulances will operate on the Fair grounds. There is also a truck carrying a portable X-ray equipment, and a launch with every provision for resuscitation in cases of drowning.

While it is true that these precautions are being taken largely for the benefit of the visitors, it is equally true that all health officers, nurses, inspectors, and, in fact, everyone interested in the health preservation of masses will find much of interest and instruction.

Another interesting question comes up. There are some 250,000 automobile trailers in the United States, and questionnaires indicate that between 10,000 and 12,000 will be brought to New York, many to be occupied by the owners during their visit. Of these, it seems that two-thirds expect to find facilities for parking and living within a short distance of the Fair. It therefore seems desirable that a camp adjacent to New York capable of accommodating 1,200 trailers, provided

with sewerage, baths, lights, etc., be established, since there are no large trailer camps in the vicinity of the city. The matter is engaging the attention of the authorities and the health officers of the counties adjacent to New York are studying the question and preparing to meet it. A conference of the Health Officers of the New York Metropolitan Area was held January 24, 1939, and it was the general opinion that the trailer problem might be a real one. No provision has been made up to the time of writing, but the health officers are awake to the problem and there is little doubt that it will be taken care of efficiently by the time the trailers begin to arrive in numbers.

LETTER TO THE EDITOR

TO THE EDITOR:

As a member of your important Association, I take pleasure in informing you that in collaboration with Dr. David R. Iriarte, I yesterday presented to the National Academy of Medicine an interesting work on Carate, or Mal de Pinto, indicating that for the first time in Venezuela we have found the germ which produces this disease. Its characteristics coincide with the findings of Grau and Triana in Mal de Pinto. It belongs to the Spirochaete family, Genus treponema of Noguchi.

The germ causing Carate or Mal de Pinto in Venezuela and Mexico is a treponema, very slender, measuring from 15–18 microns in length by 0.20 to 0.25 microns in width, with 12–16 rigid spirals. It has rotating movements around its major axis without propulsion, changing slowly in the dark-field, sometimes taking the form of a circle, sometimes a rod with symmetrical nodes at equal distances. In the blood-lymph obtained by scarification of the affected spots, the blue as well as the red varieties, it lives for more than 3 hours under the microscope.

Carate, according to the observations of Colombians, Mexicans, Cubans, and ourselves, can no longer be regarded as only a repulsive disease, but must now be regarded as among communicable diseases like syphilis and buba (yaws), the serological reactions of Wassermann, Kahn, etc., giving strongly positive results in 100 per cent of all active cases and in 78 per cent of those clinically cured; that is, in those whose spots have disappeared after treatment based on arsenic and liposoluble bismuth preparations.

With the discovery of the treponema of Grau and Triana, we believe that all of those diseases called by a variety of names in Central and South America, beginning in Mexico with the name Mal de Pinto and continuing as Cute, Carate, Carare, Catavi, etc., down to Brazil where it is called Puru-Puru, are one and the same.

With this interesting communication concerning Carate in Venezuela, I offer my highest regards.

A. L. BRICEÑO ROSSI, M.D.
Monroy A Misericordia 145

Caracas, February 18, 1939

PUBLIC HEALTH EDUCATION*

What the Visitor Does and Thinks—The American Museum of Health, 30 Rockefeller Plaza, New York, N. Y., is appearing to the public at the New York World's Fair. In that setting is established its initial collection of exhibits, later to be moved to the permanent home of the Museum.

The Museum has received from the Carnegie Corporation of New York a grant for an extensive study of visitor reaction during the Fair. The U. S. Public Health Service is coöperating, with Dr. Derryberry of its staff in charge of the study.

As a result of this investigation, the Museum expects to have data based on objective observations which will serve to guide its exhibit policies in the future. We hope to ascertain for instance what the average level of health information is among the public so that we may have a base on which to plan our future health education efforts.

General direction of the study is under a committee consisting of Dean Dearhorn, of New York University; Dr. Rice, Commissioner of Health, New York City; and Homer N. Calver, Secretary of the Museum. Dr. Livingston Farrand is Chairman of a General Advisory Committee.

When the Western Branch Meets—July 23–28, 1939, in Oakland, Calif., the Western Branch, A.P.H.A., will offer to—

. . . members who are interested in health education of the public and health education in the schools an outstanding Health Education Symposium which will take place on four separate half-days during the week. Except for one address by an outstanding guest speaker, there will be no formal papers. The Symposium will be presided over by an authority in the field of health education. The entire group will be divided into two main sections—one devoted to school health education, the other to health education of the public. The school health education group in turn will be divided into at least three divisions—one on classroom teaching, one on school health service, and one on physical education and recreation; each of these divisions to be given ample opportunity for round-table discussion of their particular problems and presided over by an outstanding leader in this field. The group interested in health education of the public will in turn be divided into at least four divisions, each led by an outstanding authority.

Joint Health Committee Reorganized—A reorganization of The Joint Committee on Health Problems in Education of the American Medical Association and the National Education Association is announced in *The Journal of the American Medical Association* for March 25.

The general principles of the reorganized committee include that it shall be constituted of the two associations as a whole and not of any department or section of either one; that it shall include no representatives of other health agencies and shall be strictly a joint committee of the participating organizations; that it shall consist of five representatives of each organization. . . .

The principal objectives of the committee are defined as: (a) to promote a joint understanding between physicians and teachers; (b) to bring to bear on health problems in education the best thoughts in medicine and pedagogy; (c) to identify health problems in education and endeavor to promote constructive solutions for them; (d) to seek publication of the conclusions of the committee through the columns of the periodical publications of the participating organizations whenever possible and to publish pamphlets principally as reprints when special indications for such publication exist.

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22nd St., New York, N. Y.

The Mayor's Message to the Aldermen—Attention Caller Ira V. Hiscock sends the text of the annual message of Mayor John W. Murphy to the New Haven Board of Aldermen.

Under "Health," the Mayor said:

Man can have no greater or better asset than good health. Therefore one of the chief and most important obligations imposed upon those in charge of municipal government is to insist that adequately trained persons shall direct the health work of the community, that they work from a sound health plan, and that sufficient funds and trained personnel be provided to make the plan effective.

New Haven has a fine Health Department, a definite health program, and the record of previous years and of the year just past is one of accomplishment and proof of its value to our people.

Then 8 points in the record are listed, and the Mayor continues:

The Health Department has many other activities designed and carried out in the interest of public health. It is a source of satisfaction to know that this is a healthy city in which to live. Therefore, we should coöperate in every way possible with our Health Department in order that conditions here may be maintained and improved.

The Doctor Looks at the Voluntary Health Agency—Under this title a group of important aspects of public health were presented at Kansas City, Public Health Education Section, by Paul A. Teschner, B.S., M.D., Assistant Director, Bureau of Health Education, American Medical Association.

Dr. Teschner said, in part:

The medical profession has always stood, and stands today, in favor of public health work and public health education of the right kind and properly directed by competent experts in their field. Such work is of value to the community in bringing about a betterment of the public health.

It is impossible to give a description of every voluntary health agency in the field. I prefer the word "voluntary" to "private" health agency, because voluntary appears to be a genuinely descriptive term for those organizations, most of which are doing a good job in a field that is not overcrowded. Since they have solicited the public for funds to accomplish their work, they no longer have a just claim to the term "private."

The physician's conception of a voluntary health agency which he can support is an educational institution; a valuable factor in the dissemination of health knowledge; a pioneering agency breaking new ground; a research organization. This agency coöperates in bringing education to a public in search of health, and works toward greater efficiency in the prevention of disease. The prevention of disease years ago was a matter between the physician and his patient. Today, it is no longer possible for the physician singly to carry out this all-important work. Prevention of disease requires not only physicians, but biologists, laboratory workers, nurses, administrators, educators, etc.

The physician also sees the voluntary agency as a compiler of health facts as well as a disseminator of the knowledge gathered by others. To him, the agency becomes a research body as well as an educational institution. The physician looks at all three groups concerned in the public health in the following way:

1. The practising physician deals with the family and the sick individual in each family.

2. The health officer deals with a group of families—not the single families, but the group called the community. He deals with these individuals in health, not in illness.

3. The voluntary agency adopts both the individual families as well as the community family. Its concern is with special members in each family.

. . . Large numbers of the public have been educated to the point where it now no longer fears certain illnesses nor expects certain diseases. Rarely do we find an educated individual who expects to die of scarlet fever, typhoid fever or even tuberculosis. Due to the rapidity with which news is disseminated, it now does not require twenty years for news of a medical discovery to be given to the man in the street. The information is given to him almost as rapidly as it is compiled.

Centuries ago, the blind, the crippled and the mentally defective were abandoned to their fate. As man progressed and became more humane, the blind, the crippled and mentally defective were given custodial care which, in most instances, was inferior. Today, efforts are being made toward the prevention of these conditions and toward the rehabilitation of those individuals who suffer from any of the three. No longer is it simply custodial care, but earnest endeavors are made to restore them to as nearly normal as possible. . . .

. . . Even though the general public, as

exemplified by the man in the street, learns of medical discoveries almost immediately, time is still required for the value of such discoveries to become manifested. The physician wisely refuses to accept without verification the work of any one individual. He chooses to wait until that work has been proved or corroborated by other workers arriving at the same conclusions. When the work has been corroborated, then is time enough for a general acceptance of new discoveries, new methods of treatment or improvements in treatment by the medical profession.

It is here that the voluntary health agency can play its most important part. The agency can, by its special technics, interpret to the public the new discoveries and new methods of treatment for the various disease conditions. Some may hold that this is the job of the official agency. It is impossible for the official agency to go as thoroughly into such problems as can the voluntary health agency. It is impossible for the individual physician to educate the public as thoroughly as can the voluntary health agency. The voluntary agency's field is not treatment. Because of its specialization, the agency is able to do a far better job of interpreting to the public the known factors about a particular disease. By the use of special technics, by the use of funds for research, it can do a job of which the agency as well as the official health agencies and the medical profession can be proud.

For example, the individual physician cannot write to his patient and family and say, "Come in to see me next January if you are crippled from infantile paralysis," "Be sure to visit me next March for heart disease," "For tuberculosis, my office will be open to you in April," and "Come to see me in November about cancer." The voluntary agency can say to all patients of all physicians—"The time to determine whether you are free from heart disease is now," "Now is the time to see if you are safe from tuberculosis."

The agencies serve best in research by developing their special technics and by concentrating their efforts on a single problem. The practising physician and the health official cannot follow in detail all the suggestions made by all the agencies. He must choose from each organization the material that appears to him of greatest importance and usefulness for his practice or community. . . .

. . . Throughout the years, since the formation of each agency, physicians have supported them in matters that they deemed were in the best interest of the public health. Most of the voluntary agencies had physicians among their founders and today have physicians on their governing boards. Nevertheless, the physician still reserves the right to disagree with policies and aims which may seem to him contrary to public policy. All the physician asks is that the agencies carry out their purposes as they themselves have stated them in their articles of incorporation or organization. He asks only that the field of treatment be left where it properly belongs—in the hands of the physician trained to do so. The key-note for success for education of the public is coöperation between the medical profession, the official health agencies and the voluntary health agencies.

Instruction of Food Handlers—Last year plans were made for giving required instruction to all persons handling food in Flint, Mich. Director H. S. Adams, Division of Food and Sanitation, Dept. of Public Health, explains the plan:

To make this instruction period more valuable and educational, a series of pictures were taken in Flint food handling establishments, depicting certain sanitary procedures and measures which are generally conceded to be of value. Two instruction periods are held each week, one on Monday afternoon, and the second on Tuesday evening. At this time a series of 12 slides are shown and an illustrated lecture given. We begin by placing emphasis on good physical health, and make mention of certain diseases that may be transmitted through food. Stress is placed upon the importance of a proper physical examination. Personal hygiene is next discussed, including the importance of personal cleanliness and hand washing, and the significance of wearing clean washable outer garments is stressed.

From personal health and hygiene, we then discuss methods used in food establishments, and pay particular attention to the sterilization of dishes, glassware, and eating utensils. Slides are shown on the proper protection of food products from contamination. Another slide, showing the interior of a modern pasteurization plant, is used, which gives opportunity to stress the importance of pasteurization and the necessity for care in handling dairy products. In conjunction with the subject of milk, a slide is used showing milk being served to a restaurant customer from the original container. In addition to the slides, we have shown a motion picture entitled "Our Common Enemy." This depicted the life cycle of the common house fly and

stressed very well the germ-carrying ability of the fly. This was in line with our food ordinance regulations, requiring that food and food products be protected from the fly nuisance.

Director Adams says further:

We believe that the illustrated lecture for food handlers, conducted routinely, as is the case here, has not been developed to the extent it deserves. We would be very pleased to learn of other departments that are working on a similar plan. From our standpoint, the results of this educational work, over this relatively short period of time, has seemed to have been very worth while.

An Exhibit in New York—Returning to New York after a 2 year 15,000 mile tour of the United States, the famous Transparent Woman, who made her debut at the New York Museum of Science and Industry in August, 1936, began a second appearance February 28 at the Museum in Rockefeller Center. The return engagement was a result of the inquiries about the unique transparent figure which have been received at the Museum ever since it left there early in 1937. An average of 200 persons a week have asked for the exhibit during the past 2 years.

The exhibit, the contribution to public health education of S. H. Camp, of Jackson, Mich., will be on view during the World's Fair, with special lecture demonstrations every hour.

RADIO

Beginning on March 4, the radio health program which has been sponsored since 1932 by the Baltimore City Health Department and the Medical and Chirurgical Faculty of Maryland changed its general nature from a 5 minute talk to a 15 minute health drama. To do this, Station WFBR and certain volunteers from the little theatre groups in the city have assisted in establishing The Baltimore Health Players.

For the 4 Saturday evenings in March a trial was made in dramatizing important "Keeping Well" messages as follows: March 4, "They've Got to Have It" (Measles); March 11, "Murder by Love" (Diphtheria Prevention); March 18, "Milk"; and March 25, "The Scarlet Scourge" (Scarlet Fever).

If the venture proves successful, it is hoped to continue The Baltimore Health Players on successive Saturday evenings at 7:30 o'clock. Topics already selected for these broadcasts include lead poisoning, maternity hygiene, pneumonia, and syphilis.

The Department of Social Welfare and Public Health, American Home Economics Association, has a committee for the Exchange of Radio Scripts. The committee now offers 14 scripts in narrative form, and 22 dialogues, most of which have to do with foods and nutrition. Borrowers pay postage both ways. For a list of scripts, write to: Pauline Murrah, Nutrition Consultant, Dept. of Health, 125 Worth St., New York, N. Y.

For facts about radio ownership and use in rural America, by states and groups of states, see "The Joint Committee Study of Rural Radio Ownership and Use in the United States." Joint Committee on Radio Research, 420 Lexington Ave., New York, N. Y., includes carefully detailed and illustrated description of the study methods.

If one wishes information about short wave educational programs, write to Station WIXAL, University Club, Boston, Mass.

Some topics from Connecticut Dept. of Health, Hartford:

The public more aware of syphilis . . . Investing in community health (public funds for health) . . . Why wait for toothache? . . . Your health and how to protect it . . . The 1939 baby (what is being done for babies).

"Your Child's Health" is the spring

theme for Homemakers Forum Radio Program, broadcast over Station WOR, and short wave via W2XJI, every Thursday, 1:45 P.M. For a program and for single copies of the talks, write to Homemaker Forum, New Jersey College of Agriculture, New Brunswick.

Says *Weekly Bulletin,* City Dept. of Health, Albany, N. Y.:

> Tired of the blatant ballyhoo over the radio, a New York physician, Dr. N. Thomas Saxl, writes to the *New York Medical Week:* Why not fight fire with fire? When one listens to the daily radio programs one cannot but be impressed by the fact that a goodly percentage are sponsored by proprietary medical products. The constant repetition of "Physicians prescribe" or "Doctors advise" or "Ask your doctor" is bound ultimately to impress the laity with the veracity of such statements. Would it not be possible for the proper committee of the New York County Medical Society to note these for a period of time and then reply through the medical information bureau in one of our own medical broadcasts that these products do not have the sanction of organized medicine?

MAGAZINE ARTICLES

"Health Committees in Rayon," "Hosiery Workers Join the Anti-Syphilis Crusade," and "Milwaukee Labor Leads Fight for Medical Center" appear in the health section of "Workers' Education through Action," an issue of *Affiliated Schools Scrapbook,* 302 E. 35th St., New York, N. Y. Feb., 1939. *25 cents.*

"'Incubator Rooms' Save Premature Babies' Lives." Two pages of pictures. *Life,* 330 E. 22nd St., Chicago, Ill. Mar. 13, 1939. *10 cents.*

We have not seen the following, not altogether self-explanatory, topics which have appeared in *Look,* Des Moines, Ia. (*10 cents* a copy.):

"An Open Letter to American Doctors" (Jan. 17, 1939) . . . "Doctors Fight Back" (Jan. 31) . . . "The Fight on Syphilis" (Feb. 28) . . . "Science Studies Bad Breath" (Mar. 14).

"Why Colleges Are Teaching the Facts of Marriage," by Dr. E. R. Groves (6 pages); "These Are the Charles McMahons: Their Slum Home Is America's Housing Problem" (6 pages—how they live and what it does to them). *Look.* Apr. 25, 1939. *10 cents.*

"Miners and Doctors." Editorial. *New Republic,* 40 E. 49 St., New York, N. Y. Mar. 29, 1939. *15 cents.* Medical care in 4 coal producing states.

"Doctor, Here's Your Hat." *Publishers Weekly,* 62 W. 45 St., New York, N. Y. Mar. 25, 1939. *15 cents.* Describes how Dr. Joseph A. Jerger has been debarred from hospitals because of his writings.

"The Logic of Coöperative Medicine," by M. Shadid. *Social Frontier,* 525 W. 120 St., New York, N. Y. March, 1939. *35 cents.* "Coöperative medicine is a compromise between competitive and socialized medicine."

"Take It Easy: Dr. Jacobson Talks with Edith Gates about Relaxation." First things on an important subject. An example of interview form of presentation. *Womans Press,* 600 Lexington Ave., New York, N. Y. April, 1939. *20 cents.* See it at any local Y.W.C.A.

REPORTING

"Annual Report" of Chief Medical Officer, New Brunswick, Canada, has a table of contents, that sometimes missing but always commendable feature. Unfortunately it does not mention health education.

A "different" mimeographed report is that issued by Anti-Tuberculosis League, 6101 Arcade Building, Seattle, Wash. Letter size pages; one side each leaf blank; large size cartoon characters on several pages ask significant questions—which are answered. A slightly more opaque paper would have given a better effect, and slip sheeting would have aided.

"Health in 1918 and 1938" is studied in *Birmingham's Health,* County Board of Health, Birmingham, Ala. January, 1939. Use is made of some pictographs. To us these pictorial comparisons should have been twice as large to be effective, with no increase in the size of the lettering, which now rather overshadows the accompanying pictures.

"A Million Vaccinations," and "The Threat to the Western Hemisphere," are two of the chapter headings in "A Review for 1938," Rockefeller Foundation, New York, N. Y.

"New Health Records Established in 1938," a heading in *Michigan Public Health,* State Dept. of Health, Lansing. February, 1939. Includes a high birth rate, and a low death rate.

"Fifty Years of Public Health" in Florida is celebrated in *Florida Health Notes,* State Board of Health, Jacksonville. January–February, 1939. A half page summary by each of the present bureau heads is accompanied by a photograph. Elizabeth Bohnenberger, director, speaks for Division of Health Education.

"The World Is Fairer," is the annual report of Hope Farm, New York, N. Y., a country home and school for dependent children. Title page (second cover page), and map (third page of cover), are imprinted in blue over a light background of farm scenes. Five pages carry a series of small outline sketches and brief paragraphs, each with a milestone bearing the mileage and the date of a highlight in progress of the institution.

Must Know All, Be All, Do All—Applications were invited, by April 20, 1939, by U. S. Civil Service Commission, Washington, D. C., for health education jobs with U. S. Public Health Service. The duties:

Associate Health Education Specialist—With considerable independent responsibility in relation to a specific subject matter, to plan and execute educational campaigns pertaining to specific diseases, sanitation, and administrative problems of public health; to determine the most effective subject matter, form of presentation, media employed, and integration of such campaign with other phases of public health education and the work of other agencies in the same field; to prepare all materials to be used in connection with such educational campaigns, including articles, speeches, pamphlets, folders, bulletins, and other popular publications; to plan application of photographic and art work to layout; to prepare captions; to plan and execute ideas for exhibits for meetings of medical societies, health organizations, etc.; to prepare radio scripts suitable for a public health educational campaign; to prepare scenarios for motion picture, slide film and lantern slide use; to develop photographic and art materials to be used in connection with this program; to act as liaison between the Service and the press, the radio industry, motion picture industry, and other outside groups on matters involving problems of popular health education and the presentation of the scientific work of this Service.

Assistant Health Education Specialist.—To read, understand, and interpret highly technical materials of medical, public health, engineering, educational, economic and sociological character pertaining to the program of this Service, and coöperating health and medical agencies; to conduct research studies, investigations and demonstrations relating to the effectiveness of public health educational programs conducted by this Service, State and local health agencies, schools and colleges, and voluntary groups; to assist upon assignment in consultation with State and local health departments and educational authorities and school authorities on public health educational matters; to act as liaison with voluntary agencies coöperating in public health work.

The "Associate" will be paid $3,200 a year, the "Assistant" will receive $2,600 a year. Among the requirements:

Applicants for either position must have successfully completed a full 4 year course leading to a bachelor's degree in a college or university of recognized standing.

Assistant Health Education Specialist—Additional Requirement—In addition, except for the substitution provided for below, applicants for the position of Assistant Health Education Specialist must show at least 2 years of postgraduate study successfully com-

pleted toward a certificate, diploma, or a degree in Hygiene or Public Health in a college or university of recognized standing.

Substitution of Experience for Postgraduate Education—Applicants for the position of Assistant Health Education Specialist may substitute, year for year, up to a maximum of 2 years, for the prescribed postgraduate study, experience described below under "Associate Health Education Specialist." In any case at least 1 year of such substituted experience must have been in public health work.

Experience—Associate Health Education Specialist—Except for the substitution provided for below, they must show at least 3 years of experience in program building, publications, or public relations work for a recognized educational organization or agency, either governmental or private, an aggregate of 1 year of which experience must have been in public health work.

Substitution of Additional Education for Experience—Applicants may substitute, year for year, up to a maximum of 2 years for the required experience, postgraduate study toward a certificate, diploma, or degree in Hygiene or Public Health successfully completed in a college or university of recognized standing, provided that the 1 year in public health work prescribed under "Experience" above must be shown.

Nonqualifying Experience—Teaching, either adult or juvenile, or clerical or similar office experience will not in itself be regarded as qualifying.

For a full statement, address the Commission, mentioning the job titles, and U. S. Public Health Service.

IN BULLETINS OR JOURNALS

"A Challenge to Nursing Information Committees," by K. F. Young. What to do to secure the best possible student nurses. *American Journal of Nursing*, 50 W. 50th Street, New York, N. Y. April, 1939. *35 cents.*

"Communicable Diseases" is the general topic for the January–March, 1939, issue of *The Commonhealth*, Massachusetts Dept. of Health, Boston.

"Doctor Quiz" heads a column of questions and answers in *Health Briefs*, Tennessee Dept. of Public Health, Nashville. March 15, 1939.

"The Educational Possibilities of the School Lunch," by M. G. McCormick. *Journal of Home Economics*, Mills Building, Washington, D. C. April, 1939. *30 cents. Reprint, 10 cents.*

National Negro Health News, U. S. Public Health Service, Washington, D. C., in October–December, 1938, reports on past and coming Negro Health Week and year round health activities.

"The Pharmacist and Public Health." *Health Bulletin*, State Dept. of Health, Richmond, Va. March, 1939. A little considered subject. For both druggist and public health worker.

"Oh, That's How It Is," by Ruth J. Larsen, lecturer on social hygiene. *State Board of Health Bulletin*, Madison, Wis. January–March, 1939. Explains how the title expresses the response of high school girls to real facts.

BOOKS AND REPORTS

Landmarks in Medicine. *Laity Lectures of the New York Academy of Medicine. Introduction by James Alexander Miller, M.D. New York: Appleton-Century,* 1939. 347 pp. Price, $2.00.

Among the several series of "Laity Lectures" collected in volumes by the New York Academy of Medicine, this will rank among the best. It is largely historical, some of the individual lectures being entirely so, but all of them have their application to present-day problems and interests. A number of texts may be found in this latest volume which are peculiarly apt at this moment when laymen are criticising the medical profession and taking steps to interfere with the good work it is doing. For example, it is pointed out that 500 years ago the average life expectancy was only 8 years, while now it is at least 50 years more and that this marked betterment has come through the efforts of medical science which "has become perhaps the strongest force acting toward human betterment in modern civilization"; and that this modern civilization itself is built largely upon medicine.

The lecture, "Dr. Watson and Mr. Holmes," is of great interest as well as practical. It is safe to say that not many doctors know what the up-to-date coroner and the medical examiner go through in the study of crime as well as of sudden death from any cause.

Among other notable lectures is that by Raymond Pearl on "The Search for Longevity." The conclusion reached is that the "length of life is generally in inverse proportion of the rate of living." The story of more than 2,000 nonagenarians and centenarians revealed that the "vast majority of these extremely longevous folk were of a placid temperament, not given to worry."

The lecture by Dr. Reginald Burbank, on Medicine and the Progress of Civilization, is a well done history of medicine, which unfortunately contains one very incomplete and erroneous statement. He says Sternberg, Laveran and Munson (sic) made it possible to eradicate malaria. Laveran was the discoverer of the malarial parasite. Sternberg introduced Laveran's findings to the profession in America. Munson, evidently intended for Manson (Sir Patrick Manson) outlined theoretically the mosquito transmission of malaria, but Ross, to whom we owe more than any other single man in this respect, with the exception of Laveran, is not even mentioned.

The book ends with an excellent chapter on X-ray by Dr. Cole, a pioneer who has constantly done much to develop the application of X-ray to diagnosis.

All the lectures here collected are excellent, and the selection of a few for special mention is no disparagement to the authors of the others. It is hard to praise the collection too highly. The printing and make-up are excellent.

MAZŸCK P. RAVENEL

The New Food, Drug, and Cosmetic Legislation. *Law and Contemporary Problems. School of Law, Duke University, Durham, N. C. Winter,* 1939. 182 pp. Price, $.75.

State and local health officials who are concerned with the preparation or the administration of food, drug, and cosmetic legislation will find much

practical and interesting information in this bulletin. In nine articles by as many authorities there are presented excellent analyses and discussions of the new federal laws on these subjects, together with an outline of state legislation pertaining to food, drugs, and cosmetics. While some of the material is conjectural, particularly with reference to the future legal status of these acts, all of it will be of value to the student of these important problems. Here is a veritable textbook at the cost of a magazine. JAMES A. TOBEY

Annual Report of the Public Health Commissioner with the Government of India for 1936—*Government of India Press, New Delhi,* 1938. 353 pp. Vol. I with appendices.

This exhaustive report deals with both the treatment and prevention of disease in India. Descriptive material is well illustrated by charts and maps. Data are presented to show for the population of British India (282 million) a density per square mile of 321, a birth rate of 35, a death rate of 23, and an infant mortality rate of 162. There is noted a decrease in mortality from smallpox, plague, and cholera. The number of primary vaccinations against smallpox performed (11,047,662) has increased steadily but still only reaches about half of the infants. Under preventive medicine, emphasis is given to the necessity for raising the standard of living of the Indian people, schemes of rural reconstruction being given special attention. One section is devoted to the work of research institutions including the All-India Institute of Hygiene and Public Health, and the School of Tropical Medicine.

IRA V. HISCOCK

Adventures in Living: New Ways for Old—*By Thomas D. Wood, M.D., Marion O. Lerrigo, Ph.D., and Nina B. Lamkin, A.M. New York: Thomas Nelson & Sons,* 1938. 320 pp. Price, $.88.

New Ways for Old is the sixth in a series with the general title "Adventures in Living." The authors in their preface addressed to the teacher set forth the following sound objectives as guiding principles for the whole series:

> To teach health as a means to accomplishment and not as an end in itself.
>
> To emphasize happy, healthful living, rather than the details of techniques.
>
> To promote the growth of the whole child by activities which give him real experiences in healthful living.
>
> To create in the mind of the child an attitude of respect for the body and its processes, and to teach about the body as a whole, rather than as a collection of anatomical systems.
>
> To provide for healthful experiences without making the child introspectively health-conscious.
>
> To suggest individual and coöperative projects of social value, utilizing school, home, and community experiences.
>
> To integrate health education with other school subjects and activities.

It would seem that these aims have been pretty successfully carried out in the making of the book under review. The subjects usually included in all such school texts are here but are discussed in a rather unusual and interesting way. The attempt is made (indirectly of course) to suggest incentives for the practice of health habits—as, for example, in the unit entitled "Your Social Life." Incidentally, would not life on this footstool be transformed if some sure-fire way were discovered to teach children how to control their emotions and to enjoy the process of health habit formation?

The device of comparing school life of the early days of this country with our modern ways adds to the interest of this book. The illustrations are simple but to the point. There is a glossary and the index seems adequate.

MERRILL E. CHAMPION

The Social Work Year Book—1939—Fifth Issue—*Edited by Russell K. Kurze. New York: Russell Sage Foundation,* 1939. 730 pp. Price, $3.50.

An anticipated and necessary addition to the reference shelf, the Fifth Issue of the 1939 Social Work Year Book promises to be even more helpful than its very useful predecessors.

Eighty-two topical articles by distinguished and knowledgeable contributors comprise Part I and provide authoritative information on welfare activities conducted on a national scale.

Part II is a state-by-state account of social work under governmental auspices.

Part III is the familiar and comprehensive Directories of Agencies in social work and related fields, national and state, public and private.

Much of the information presented in the *Social Work Year Book* is unavailable elsewhere and is nowhere available so conveniently and in such organized fashion. W. R. WALSH

The Truth About Childbirth—*By Anthony M. Ludovici. New York: Dutton,* 1938. 294 pp. Price, $2.50.

"Lay Light on Maternal Morbidity and Mortality," the subtitle to this challenging volume, does not give a sufficient hint as to what follows. In brief the author claims that childbirth should be a normal physiological process. To this statement he will have general assent, but when he affirms that it should be not only a painless affair, moreover, a pleasurable experience, even without anaesthetics or analgesics, he is placing himself in a vulnerable position. His assertion that maternal morbidity and mortality can be reduced considerably may be accepted if we could secure the application of skilled obstetric, nursing, and hospital technics to all mothers regardless of economic circumstances.

Mr. Ludovici blames "the flight from motherhood" largely on feminism, economic conditions, and what he calls "pornocracy" *i.e.*, a state of society in which exhibitionism, smartness at all costs, cars, wireless sets, and any number of amusements without which our happier ancestors did perfectly well, are preferred before natural, simple, and satisfying pleasures for health is the first prerequisite. His solution of our present predicament would be more marriages at earlier ages, more children per marriage, hygienic living, and less meddlesome obstetrics.

It would be an injustice to the author if we did not recognize that an extensive amount of research into the socio-economic and medico-hygienic aspects of the subject had gone into the making of this book. It is thoroughly documented with references and explanatory notes. Whether we agree or disagree with the author's conclusions we will be instructed by the novel material he has introduced. It will be a stimulating but provoking book, especially to the medical profession and to ultra-modern women.

RICHARD A. BOLT

Classic Descriptions of Disease, *With Biographical Sketches of the Authors—By Ralph H. Major, M.D. Springfield, Ill.: Charles C. Thomas,* 1939. 727 pp. Price, $5.50.

The first edition of this book appeared in 1932 and was widely welcomed. It has made available for students who do not have access to great libraries and who do not know languages most of the epoch-making discoveries in this field of medicine. The second edition has been revised and the author has taken cognizance of certain errors and omissions, some of which were pointed out by friends and those who were interested in the plan and object of the book.

The second edition includes new sec-

tions covering malaria and yellow fever. A number of the biographical sketches have been rewritten and the index has been revised and enlarged. It now contains 403 selections from the epoch-making accounts of disease of 190 pioneer authorities.

It is hard to speak too highly of the value of this book. Each selection given is "either the first known, one of the earliest, or one of the most interesting accounts of the disease in question." The selection has been done with the judgment which comes of a wide study of the classics of medical literature, by one who has an intimate knowledge of the languages involved, so much so that most of the translations have been made by the author personally. He tells in the Preface of the First Edition that Dr. Osler stressed the value of advising students to study classic accounts of disease.

At present when we are perhaps too much given to rushing after new things, it is to be hoped that such books as this will be made required reading in all medical schools. Particularly valuable to the student are the short biographical sketches of those from whose accounts selections are here given.

There are 137 illustrations, many of them being portraits, which are both interesting and valuable. The printing and make-up are typical of the fine work of the publishing house from which it comes. The book can be unreservedly recommended to all libraries, medical or otherwise, and to all who are interested in the history of medicine.

MAZÝCK P. RAVENEL

Public Welfare in Transition: Annual Report—*By William Hodson, Commissioner. New York: Department of Public Welfare of the City of New York* (902 Broadway), 1937. 132 pp.

Elimination of relief for able-bodied men and women through adjustments in our social and industrial systems, wider and more adequate social insurance coverage to reduce further the nation's home relief rolls, and a flexible relief program for the residual caseload of unemployables that can be contracted or expanded as needs indicate, are urged in the 1937 annual report of the New York City Department of Welfare.

In December, 1937, New York State had a total of 102,926 needy persons over 65 years of age receiving Old Age Assistance. This means that out of every 1,000 individuals 65 years and over in New York State, 133 received this kind of aid. Thirty-eight states had a larger number of recipients per 1,000 than New York.

At the end of the year 10,258 veteran families, comprising over 35,000 individuals were under the department's care. The cost of veteran relief for the year exceeded $4,000,000. Eighty-five per cent of the Veterans' Division staff are ex-service men. Approximately 4,000 employable veteran recipients were given WPA employment during the year. Improvements in aid to needy veterans included a more elastic budget, medical and nursing services, prescription allowances, dental and optical treatment, housekeeping service in emergencies, and other aid, as needed. The Division of Blind Assistance was formed in May, 1937, to administer financial aid to eligible blind persons in accordance with the revised State Public Welfare Law and Federal Social Security Act. Prior to 1937, assistance was given to the "Poor Adult Blind" in semi-annual installments under the provisions of the Charter of the Greater City of New York. The principal changes under the new law are: assistance is issued on a monthly basis; the budget is based upon actual minimum requirements; eligibility for assistance is more carefully determined; consideration is given to the special

needs incident to blindness. Increased allowance enables the recipient to sustain himself without street begging or supplementation from other agencies, Mr. Hodson points out, and the recipient is able to plan his expenditures to better advantage with payments made each month instead of semi-annually. A total of $183,768 was expended for Blind Aid last year.

At the end of the year there were 22,692 destitute, neglected, or abandoned children under the care of the Children's Division of the department. Home relief has tended to reduce the number of children who had to be cared for by the department in boarding houses and institutions. The department expended approximately $27,000,000 during 1937, of which $15,025,000 were city funds, $6,280,000 were federal funds and $5,695,000 were state funds.

IRA V. HISCOCK

Emotional Hygiene: The Art of Understanding—*By Camilla M. Anderson, M.D. Philadelphia: Lippincott,* 1937. 242 pp. Price, $2.00.

This is one of the finer examples of popular treatment of mental hygiene that professional writers on the subject have turned out in increasing quantity in recent years. As such it will play a useful part in the growing importance of public education in the principles and practices of mental health as visualized by those engaged in organized work in this segment of the public health movement. The author has turned to good account her valuable experience as Secretary of the Pennsylvania Mental Hygiene Committee, and as a psychiatric teacher in the field of nursing education, in bringing the complexities and ramifications of the subject down to the level of understanding of the "man in the street." Indeed, she has done it "almost too well" in that she has over-simplified some of the theories and concepts of the "new psychologies" upon which mental hygiene is based, and perhaps exaggerated their therapeutic and preventive values, but this is a minor criticism to make of what is, on the whole, a sound exposition of its fundamentals as generally accepted and taught by present-day psychiatry, and presented in an unusually attractive and readable fashion.

Significantly, the title of the book emphasizes the primacy of the emotions as against the intellect in determining healthy mental adjustment and personality development, as conceived by modern students of human behavior oriented to the philosophy and outlook of twentieth century mental medicine and hygiene. The critical reader may find fault with some of the spiritual interpretations of human nature, as the author develops them in the light of Freudian psychology and where they conflict with more orthodox and traditional theological and moral concepts, but, discounting these and after applying his own correctives, such a reader will agree with the general tenor of her discussions and will accept her teachings as having great practical value in the everyday task of the everyday man in better understanding and dealing with his fellow man.

PAUL O. KOMORA

City Hangs Up Eight New Health Records: 1938 Annual Report from the Health Commissioner of New York to the Mayor. *Issued for release in newspapers under date of January 1, 1939.*

The introductory paragraphs of this news release summarize the outstanding features in Commissioner Rice's annual report. There follow extensive tables of statistics on the major causes of death, in which the rates for 1938 are compared with those for the last 8 years.

The whole article furnishes support

to Dr. Rice's assurance to contemplated visitors at the 1939 New York World's Fair "that everything has been done to make their stay in New York City safe from the health standpoint."

For an estimated population of 7,491,790 the general death rate of 9.8 per 1,000 recorded in 1938 is the lowest in the city's history. The reports on specific diseases indicate a similar substantial reduction in the death rates from accidents, tuberculosis, pneumonia, typhoid fever, and diphtheria, resulting in the lowest figures ever registered in the city. The infant and maternal mortality rates are also so low as to constitute a record achievement.

The Commissioner attributes the continued high rates of death from the degenerative diseases to the city's aging population. However, the specific death rates in the higher age groups for diabetes, cancer, and diseases of the heart and arteries do show a decrease. The decline in the city's birth rate has continued.

A tribute to the fine leadership of Mayor LaGuardia is tendered for his aid in advancing the establishment of the district health center program. The coöperation of the newspapers is also acknowledged for their excellent work in publicizing the venereal disease campaign.

Explanatory paragraphs accompany the statistical section which concludes the report. The tables are preceded by the general statement that health conditions were exceptionally good, with no epidemics, major catastrophies, or unfavorable weather conditions in evidence. IRA V. HISCOCK

Educational Broadcasting—1937—*C. S. Marsh, Editor. Chicago: University of Chicago Press,* 1938. 405 pp. Price, $3.00.

This is a report of the Second National Conference on Educational Broadcasting held in Chicago, November 29–December 1, 1937, the report being published October 25, 1938.

Health broadcasting is not mentioned, except when Douglas Griesemer, American National Red Cross, in a discussion reminded the audience that numerous health and welfare agencies have had considerable experience in the educational use of radio.

Notwithstanding the fact that the American Public Health Association is listed as one of the sponsors, and several national health agencies appear as coöperating groups, neither radio educational leaders nor the national adult education groups have been really conscious of health education.

This situation emphasizes the importance of the book, which offers a wealth of ideas and information on broadcasting as an educational medium, and the complications growing out of the peculiar nature of radio as a business. We need some far-sighted health people, informed and willing to participate in the broad development of broadcasting as an educational medium. This volume provides much valuable background material.

Of especial interest are chapters on "Talks Programs" (the one chapter giving something on technics), "What Happens to the Listener," "Radio and the Child's Education," "Classroom Use of Radio," and "Symposium of Listeners."

EVART G. ROUTZAHN

The Life of Chevalier Jackson: An Autobiography. *New York: Macmillan,* 1939. 229 pp. Price, $3.50.

This autobiography is not only a human document of rare interest but also the story of remarkable achievement in a new field which has brought much relief from suffering and saved the lives of thousands, mostly children. It is the story of a man who was a frail child, living under conditions not con-

ducive to high mental or physical development, and handicapped by poverty. A devotion to his parents and a natural bent for mechanics were the two great interests in his life. "An innate and insatiable urge to make things" possessed him from early childhood throughout his life. He had a struggle to get his education and for some time made his own way as a decorator of china and glass, sometimes as a book agent, and again as a member of the crew of a Gloucester fishing schooner. He finally saved enough money to go to London "the cradle of laryngology" and get postgraduate work in laryngology under Sir Morrell Mackenzie.

His practice, which began in Pittsburgh, was among the very poor, but he soon acquired a reputation for skill in diseases of the upper air passages, the beginning of his world-wide fame in esophagoscopy and bronchoscopy. He developed in 1890 his first esophagoscope which he perfected 12 years later by adapting a light such as was in use on the cystoscope. This enabled him to see into the esophagus and soon he had brought to him many children suffering from stricture due to swallowing lye. He was so impressed by the frequency of these accidents that he devoted much of his energy to laws requiring proper labeling of such dangerous poisons, and to him more than any other person is due the law passed in 1927 requiring poison and antidote labels to be put on each such container.

After some years Jackson evolved the bronchoscope which will always bear his name, and it was perfected year by year. Before his invention the mortality among those into whose bronchi and lungs foreign bodies found their way was 98 per cent; now 98 per cent survive. It must be remembered that Jackson has a marvelous skill in operation, being ambidextrous, in addition to his mechanical genius, but fortunately he is as apt in teaching as in operating, so there are now an imposing number of skilled men in this country who have come under his influence who are doing excellent work with the aid of his instruments.

The book contains 8 pages of photographs of foreign bodies—jackstones, safety pins, tacks, staples, buttons, etc., and even false teeth—removed from patients, chiefly children. The legend on each page urges prevention of such accidents.

The book itself is an outstanding example of the printer's art. Issued in May, 1938, there have been already three reprintings. Many beautiful illustrations in color by the author show him to be a master of the pencil, brush, palette knife, dry point, and colored chalk. There are also a number of photographs. Dr. Jackson has received honors from every part of the world. His book deserves to be read widely and to find a place in private as well as public libraries, medical and lay MAZÝCK P. RAVENEL

Health Education by Isotype—*By Otto Neurath, Ph.D., and H. E. Kleinschmidt, M.D. New York: American Public Health Association*, 1939. 32 pp. Price, $.25.

Almost every one of us, at one time or another, has had a health story to tell. Usually, when inspiration seizes us, we rush into print—or into display—hustling to get the job done while our ideas are still in their first state of white heat. Far too often the results are eloquent of the frenzied rush. If there is one thing that this pamphlet makes crystal clear, it is that reflection, planning, analysis, and critical appraisal are all essential in telling a health story.

Health Education by Isotype is a persuasive plea for the use of this visual language in interpreting health to young and old, to the erudite and to the

uneducated. Isotype is not offered as ready means for the mechanical translation of any health idea into pictures. Instead, it is suggested as a valuable medium through which the educator, working jointly with the specialist in the method, can often reveal social facts most effectively.

Varied uses of Isotype in text illustrations, as lecture aids, for classroom use, in slides and motion pictures, as well as for exhibits, are discussed briefly.

Every public health worker—administrator, engineer, nurse, as well as educator—will profit by exposing himself to this Isotype infection, for it tends to make one immune to that common ailment, "rush of brains to the head." To them all we commend this pamphlet. Its publication has been made possible through the generosity of the Carnegie Corporation of New York to which the American Public Health Association makes grateful acknowledgment. RAYMOND S. PATTERSON

Nutrition: The Newer Diagnostic Methods. *Proceedings of the Round Table on Nutrition and Public Health—Sixteenth Annual Conference of the Milbank Memorial Fund, March 29–31, 1938. New York: Milbank Memorial Fund, 1938.* 192 pp. Price, $1.00.

This volume sets forth the proceedings of the 16th annual conference of the Milbank Memorial Fund. One round table was devoted entirely to nutrition and its relation to public health. Impaired nutrition among the general population is sufficiently extensive to make it a matter of concern to public health agencies. Means must be devised to detect nutritional deficiencies long before they produce their most obvious characteristics. Work needs to be done in determining the constituents of optimal nutrition and means provided for their attainment by the average individual.

To these ends discussions were held on various methods for detecting early nutritional defects. Dr. T. Wingate Todd opened the discussion on the use of roentgenology. Drs. Hecht and Feldman presented the use of the dark adaptation test in detecting avitaminosis A. The detection of early vitamin B_1 deficiency by the use of the electrocardiograph and of specific color tests was discussed by Dr. Weiss and by Drs. Levine and Marples respectively. Dr. Spies covered the subject of nicotinic acid and its relationship to pellagra while Drs. Farmer and Abt discussed the utility of plasma ascorbic acid tests for latent avitaminosis C.

The detection of nutritional anemia by hematologic methods was presented by Dr. Guest. Dr. Youmans opened the discussion on the use of plasma protein determinations in the diagnosis of edema of nutritional origin.

The tables, graphs, and illustrations as well as the supplementary informal discussions, add greatly to the value of the record. The correlation of the experiences of different investigators in a conference of this type not only serves to promote scientific advance as a whole but their record will serve to inform and stimulate others.

IRA A. MANVILLE

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THE MICROBE MAN. A LIFE OF PASTEUR FOR YOUNG PEOPLE. By Eleanor Doorly. New York: Appleton, 1939. 160 pp. Price, $1.50.

WIDE ROAD AHEAD. THE STORY OF A WOMAN BACTERIOLOGIST. By Anne B. Fisher. New York: Dutton, 1939. 276 pp. Price, $2.50.

ADVENTURES WITH A LAMP. THE STORY OF A NURSE. By Ruth Louise Partridge. New York: Dutton, 1939. Price, $2.50.

A TEXTBOOK OF APPLIED MICROBIOLOGY AND PATHOLOGY. By Thurman B. Rice. 2nd ed. of APPLIED BACTERIOLOGY. New York: Macmillan, 1939. 271 pp. Price, $2.50.

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BIG FLEAS HAVE LITTLE FLEAS, OR WHO'S WHO AMONG THE PROTOZOA. By Robert Hegner. Baltimore: Williams & Wilkins, 1938. 285 pp. Price, $3.00.

REAL LIVING. BOOK I. A HEALTH WORKBOOK FOR BOYS IN JUNIOR HIGH SCHOOLS. By Ross L. Allen. New York: Barnes, 1939. 106 pp. Price, $.50.

REAL LIVING. BOOK II. A HEALTH WORKBOOK FOR BOYS IN SENIOR HIGH SCHOOLS. By Ross L. Allen. New York: Barnes, 1939. 68 pp. Price, $.50.

THE NEWER KNOWLEDGE OF NUTRITION. By E. V. McCollum, Elsa Orent-Keiles and Harry G. Day. 5th ed. Entirely Rewritten. New York, Macmillan, 1939. 701 pp. Price, $4.50.

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A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Montgomery County (Md.) Steps Out—Do you know what "the adjustment of the total personality" means? Even if you do, you will still find much of interest in this account of a year's experience with a county-wide psychiatric service. If you don't the article will prove practically a new department in your little store of knowledge.

ANON. Psychiatric Service in a County. Health Officer. 3, 10:287 (Feb.), 1939.

130,215,000 Souls — This is the population of the continental United States on July 1, 1938, as estimated by the Bureau of the Census. It is based on births, deaths, and excess of immigration over emigration. Tables are given showing estimated population annually since the 1930 census, and by states.

ANON. Estimated Population of Continental United States and Outlying Territories and Possessions July 1, 1938. Pub. Health Rep. 54, 5:180 (Feb. 3), 1939.

Life Expectancy Rate Up—Most of us assume that the actual average age at death is the same thing as life expectancy at birth. This is not likely to be true, for the expectation of life is based upon a hypothetical group subject to the same age specific rates throughout life. This is made clear in a brief note quoting Dr. Dublin's estimation of a life expectancy rate of 62.0 for last year.

ANON. Estimated Life Expectancy for the United States, 1938. Pub. Health Rep. 54, 8:311 (Feb. 24), 1939.

Slaughter House By-Products—It is a great comfort to know the derivation of the word "catgut." It is not what you think, but is supposed to have come from kit-gut, a kit being a small violin. The sanitary features concerned in the various processes of making sausage casings, etc., also make the paper an interesting one.

AUSTIN, J. The Hygienic Treatment and Disposal of Offal and By-Products in Abattoirs. J. Roy. San. Inst. 59, 9:622 (Mar.), 1939.

Health Facilities' Study — Available clinic services depend upon the size of the community. In counties predominantly, rural health programs are seriously handicapped by the absence of clinics so necessary in completing the health educational activities of the health agencies. This is the finding of an extensive survey of counties.

BOROWSKI, A. J., and PLUMLEY, M. L. Preventive Clinic Facilities Available in Ninety-four Selected Counties of the United States. Pub. Health Rep. 54, 9:335 (Mar. 3), 1939.

Anent Spiritual Vitamins—In this revealing dissertation on mental hygiene addressed to the informed layman there is much of immediate value to all health workers. Personality, we are told, derives from *persona*, the mask put on by the ancient actor. In mental disorders, the mask is broken and we see revealed in all their repulsiveness the processes of human nature. What this means in our attitudes toward public mental health administration is made clear. The desire to quote here from the many brilliant passages is almost irresistible.

CAMPBELL, C. M. Human Needs and Social Resources. Sci. Month. 48, 4:293 (Apr.), 1939.

The Physical Jerks and Public Health—One gets the impression from this British discussion that if indi-

viduals will only do something about maintaining physical fitness, then the level of public health will be raised. Health education is approved and urged as a public project. In the ensuing discussion favorable mention is made of the periodic medical examination that is " in force in parts of the U. S. A."

EDWARDS, T. P. Physical Fitness in Relation to Public Health. J. Roy. San. Inst. 59, 8:573 (Feb.), 1939.

Con Versus Pro in Social Medicine—Two able articles, one pointing out the dangers of the proposed national health scheme, and the other, the need for a method of providing adequate medical care, are presented. The editors should be widely commended for this eminently fair airing of both sides, a procedure which is all too infrequently practiced in this land of the free and the home of the brave.

FISHBEIN, M. American Medicine and the National Health Program, and

PETERS, J. J. Medicine and the Public. New Eng. J. Med. 220, 12:495 (Mar. 23), 1939.

School Attendance by Contacts—British views on the exclusion from school of communicable disease contacts. The author wishes the rigorous regulations to be changed to allow measles, German measles, and chicken pox contacts to go to school, and the return of scarlet fever and diphtheria home contacts one week after the isolation of the case.

FORBES, D. School Exclusion in Infectious Disease. J. Roy. San. Inst. 59, 8:559 (Feb.), 1939. (See also) Terminal Disinfection and Exclusion from School. Pub. Health. 52, 5:133 (Feb.), 1939.

For All Health Propagandists to Read—Here is good straightforward reporting upon experience with the health examination. The author urges others to make use of it, even though he concludes that it cannot be of great immediate importance to preventive medicine because we still know so little about the mode of origin of so many diseases.

FRITZ, R. The Periodic Health Examination as a Method of Clinical Investigation. J.A.M.A. 112, 12:1116 (Mar. 25), 1939.

Where Relaxed Vigilance Takes Its Tragic Toll—Reporting upon 470 water-borne disease outbreaks in the United States and Canada over a 16 year period, the conclusion is reached that the data presented do not indicate any inherent weaknesses in operating methods of water treatment plants, but rather that accepted methods are not always followed. Too much faith often is placed in a limited number of water tests. More attention should be given to sources of pollution, and to an ample factor of safety in plant operation. Needed research also is listed in this comprehensive study.

GORMAN, A. E., and WOLMAN, A. Water-Borne Outbreaks in the United States and Canada, and Their Significance. J. Am. Waterworks Assoc. 31, 2:225 (Feb.), 1935.

Doctors, Nurses, and Deliveries—In two rural counties in the South, a health department nursing service has done much to improve maternal health through successful home deliveries. Experience shows that this service has not detracted from the effectiveness of the generalized health department nursing program.

LAPHAM, M. E. Coöperative Obstetric Delivery Service by Private Physicians and County Health Departments. South M. J. 32, 2:191 (Feb.), 1939.

Finding Operable Cancer—Stomach, colon, and breast are the frequent sites of cancer. Extirpation is not performed in more than half the cases because they are hopeless, but surgeons are now discovering a larger proportion of operable cancers, because the medical profession is beginning to discard textbook signs supposed to be pathognomonic of

cancer (there are none of early cancer).

MACCARTY, W. C. A Hopeful Factor in the Cancer Problem. Am. J. Cancer. 35, 2:275 (Feb.), 1939.

Pertussis Vaccine Protects—Another successful experience with vaccine in the prevention of whooping cough. In the test group the communicability rate was 28 per cent, whereas it was 85 per cent in the control group.

MILLER, J. J., and FABER, H. K. Immunization Against Pertussis. J.A.M.A. 112, 12:1145 (Mar. 25), 1939.

Bending the Twig—Curious-minded sanitarians will find much of interest in this series of papers about the purposes of the Bureau of Child Guidance in the New York City schools; the difficulties inherent in a program involving two professions; and diverse administrative problems together with their solutions. A little knowledge about what others are doing never did anyone much harm.

O'BRIEN, F. J., *et al.* The Bureau of Child Guidance, Board of Education, City of New York (and five related papers). Understanding the Child. 7. 4:3 (Jan.), 1939.

Where to Hunt T.B. Cases—Tuberculosis case finding is most productive when directed to the examination of contacts and referred suspected patients, or group of examinations in certain industries and adults generally in the lower economic strata. These two types of services are of more importance than the routine examination of school children. Experience in New York State confirms this opinion, which will bring no comfort to summer campers or the open air school marms.

PLUNKETT, R. E. Case-Finding. Am. Rev. Tuberc. 39, 2:256 (Feb.), 1939.

Which Toxoid?—Animal experiments are reported which indicate that one dose of toxoid-alum precipitate equals three doses of unmodified toxoid. A high degree of immunity results from one dose of toxoid-alum precipitate followed 2 weeks later with one of unmodified toxoid, and the antitoxic titer can be enhanced by another dose of unmodified toxoid at the end of a year.

POVITZKY, O. R. A Comparison of Antitoxic Response and Persistence of Antitoxin in the Blood of Guinea Pigs Injected with Different Preparations of Diphtheria Toxoid. Am. J. Hyg. 29, 2:89 (Mar.), 1939.

Stamping Out Syphilis—Health officials and others bent on drawing up laws for the control of syphilis will do well to read all the evidence here presented which suggests the unwisdom of attempting to cover all the medical exigencies. The simpler, the better, evidently.

STOKES, J. H., and INGRAHAM, N. R. Syphilis and the Law. J.A.M.A. 112, 12:1133 (Mar. 25), 1939.

Mouth Lesions and Dietary Deficiencies—*Macacus rhesus* monkeys, whose dental formula is similar to man's and who require both vitamin C and nicotinic acid, as does man, were tested with vitamin deficient meals. Varying manifestations of gingivitis and stomatitis (in one study), and (in the other) necrosis of the periodental tissues, followed the feeding of vitamin deficient diets. Control animals had healthy mouths. One may assume that none of the monkeys brushed his teeth twice a day or saw his dentist twice a year.

TOPPING, N. H., and FRASER, H. F. Mouth Lesions Associated with Dietary Deficiencies in Monkeys, and

TOMLINSON, T. H., JR. Oral Pathology in Monkeys in Various Experimental Dietary Deficiencies. Pub. Health Rep. 54, 11:416 (Mar. 17), 1939.

It Can Be Done—Practical methods for the removal of dangerous dusts are described in this article which fixes 10 million particles per cu. ft. as the safe upper limit of dustiness. The illustrations are good, too.

URBAN, E. C. J. Ventilation in the Granite Industry. J. Indus. Hyg. & Toxicol. 21, 3:57 (Mar.), 1939.

Franklin the Hygienist — The health worker who isn't delighted with the story of "Dr." Franklin's excursions into the fields of medicine and hygiene, must be a crusty old work horse indeed. During his eighty-one years, the redoubtable Benjamin certainly did his share of philosophizing.

WRIGHT, R. D. "Dr." Franklin. Health Officer. 3, 10:308 (Feb.), 1939.

Questionable Biologic Concept Bites Dust—Collapse therapy results indicate that there is but little, if any, difference between whites and negroes in natural resistance to tuberculosis, and physical habitus appears to play no part in the different illness rates. When we, the people, decide that it will pay to provide adequate isolation for colored cases and allow better general living conditions for this population, then death rates among the colored will repeat the experience of the white race. A lot more hygienic hooey is disproved in this excellent paper.

WILLIAMS, G. D., and APPLEWHITE, J. D. Tuberculosis in the Negroes of Georgia. Am. J. Hyg. 29, 2:61 (Mar.), 1939.

"The Golden Triangle" and the "Point." The junction of the Allegheny and Monongahela Rivers to form the Ohio

PITTSBURGH EXPECTS YOU IN OCTOBER

CITIES have their own personalities, even as you and I.

Some are short, bustling individuals, always on the jump. Others are lean, white-haired men, fond of their firesides and slippers.

But the personality of Pittsburgh—"Vulcan's Workshop"—is the strength of enormous industry, the energy of coal and fire, and the vigorous pulse of great water, rail, and air transportation systems.

Pittsburgh is the birthplace of air hygiene. And the district, in which heavy industry predominates, is notable for its constructive activities in improving industrial health conditions.

Yet with all that, there is still a greater personality—a personality with culture and refinement deeply rooted in a high regard for civic duty and social responsibility.

Away from its busy terminals, its factories and stores, is the Pittsburgh of intellectual and artistic achievement, that social inner-existence of the city, made possible by municipal statesmanship.

The Civic Center of Pittsburgh has achieved international renown. Its Schenley Park, comprising 383 acres, is one of the world's finest. It was donated to the city by Mrs. Mary E. Schenley of London, England.

The Civic area forms a modern Acropolis—a city within a city—with stately cathedrals, shrines, colleges, laboratories, museums, libraries, homes, hotels, memorials, and recreation and sport pavilions, representing an investment of more than a half billion dollars.

Convention delegates will have every opportunity to visit the gigantic modern workshops of heavy industry, as well as the cultural centers of Pittsburgh.

You will see Phipps Conservatory with its 125,000 species of flowers; the famous Andrew Carnegie Museum, the Carnegie Library of a million volumes; the Carnegie Art Galleries, where the

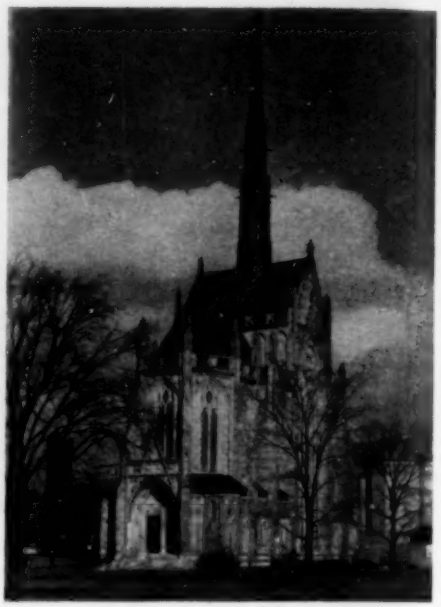
world's only International Art show is an annual feature and which will be in progress during the Association's meeting, the Carnegie Music Hall, the Mellon Institute, Heinz Memorial Chapel, Syria Mosque, which has the largest Shrine membership in the World; the Cathedral of Learning of the University of Pittsburgh, rising 542 feet into the air, the tallest skyscraper schoolhouse in the world; the terraced campus of Carnegie Institute of Technology; and the memorial to Stephen Collins Foster, composer of "Old Folks at Home" and "Old Black Joe."

Pittsburgh is not just another city. It is the heart of Allegheny County, the hub of an industrial empire, which supplies the wheels, power, generators and turbines to keep America and the rest of the world on the move, and to provide the structural materials for the "framework" of other cities. The steel for the Trylon and Perisphere of the World of Tomorrow in New York was made in Pittsburgh. Whatever the world needs from heavy industry, Pittsburgh can produce.

Pittsburgh and Allegheny County cover 21,103,980,000 feet of earth, on which live and work nearly 2,000,000 people. Last year the 2,000 manufacturing plants of the city and county shipped—over five railroads and three rivers—162 million tons of materials valued at a half billion dollars. This tonnage was 25 times that which passed through the Panama Canal in the same year.

In the county are 4,000 farms, valued at $33,000,000, whose products last year sold for $7,000,000. Our steel, iron, coal, aluminum, glass, food, electrical and other supplies of all kinds have been placed on markets in all parts of the world.

Pittsburgh produces the steel for skyscrapers, bridges, houses, highways, ships and hair curlers, just as examples of the more than 5,000 uses to which



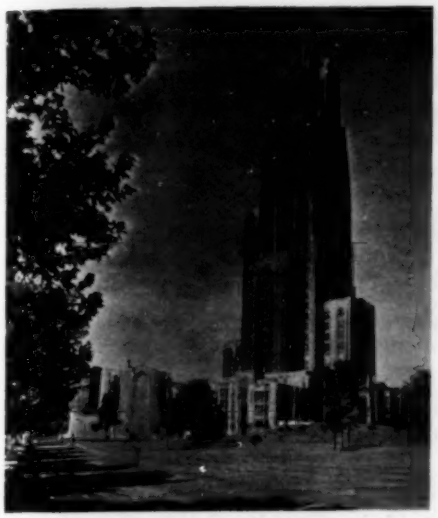
The Heinz Memorial Chapel of the University of Pittsburgh

this indispensable metal has been applied. The aluminum pots and pans in which your food is cooked come from Pittsburgh, and Heinz food specialties are found on millions of tables.

Pittsburgh fabricates aluminum and steel for streamline trains. It furnishes the steel rails, locomotive parts, the air brakes and generators which make the trains move over the large railroad network from the Atlantic to the Pacific Coast and throughout the world.

And Pittsburgh supplies much of the steel and most of the safety glass which go into the annual production of more than 4,000,000 automobiles. The famous Westinghouse Electric and Manufacturing Company, whose founder developed the use of alternating electric current, manufactured the recently installed huge electrical apparatus for the generation of power and the furnishing of a water supply to Pacific Coast cities from Boulder Dam.

Likewise, the contributions of Pitts-



World's Tallest Educational Building. The University of Pittsburgh's "Cathedral of Learning," 42 story Gothic structure which houses the undergraduates' schools, School of Law, Bureau of Business Research, Research Bureau for Retail Training, Graduate School, libraries, classrooms, and offices. Twenty-two other buildings on the campus house the professional and technical schools

burgh men and women in the conservation of health, and in medical and biological research, have been outstanding.

In Pittsburgh are located 38 hospitals. Within the metropolitan limits 1,800 physicians and surgeons minister to the needs of the community.

As an example of teamwork between medical science and heavy industry, surgeons found some months ago that a new form of stainless steel can be used remarkably well for permanent braces or for plating broken backs, arms and legs.

Behind the rugged grandeur of the Steel City and its products, is the less apparent but equally dramatic story of Pittsburgh's preëminence as a center of science and industrial research. This research is constantly creating new and better articles for the markets of the world and the comforts of mankind.

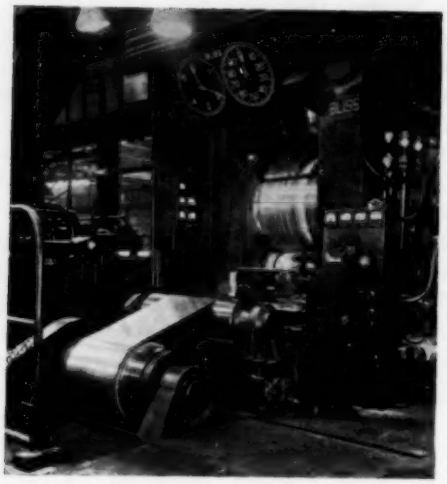
Mellon Institute, through its pure and applied researches, ministers to the humanities and to the industries. Extensive laboratories are maintained in the district by the U. S. Bureau of Mines and by the following world-known commercial enterprises: Aluminum Company of America, Carnegie-Illinois Steel Corporation, Gulf Oil Corporation, H. J. Heinz Company, Jones & Laughlin Steel Corporation, Pittsburgh Plate Glass Company, and Westinghouse Electric & Manufacturing Company.

From the laboratories of the Standard Chemical Company of Pittsburgh came the first radium produced in the United States. This gift to the medical profession of America was developed in 1913.

Air Hygiene Foundation, a national science organization supported by 250 industrial concerns throughout the country, maintains headquarters in Pittsburgh at Mellon Institute. The Foundation is working for the improvement of employee health in the nation's plants and mines, and for the prevention of occupational disease.

The city boasts five institutions of higher learning, all of which are well equipped for science studies. These institutions are University of Pittsburgh, Carnegie Institute of Technology, Duquesne University, Pennsylvania College for Women, and Mt. Mercy College.

The new home of Mellon Institute



A reversing mill at the Irvin Works of the Carnegie-Illinois Steel Corporation

Yes, Pittsburgh furnishes the eye-appealing answer to the dreams of countless Americans who wish to paint, see, hear, feel and record the march of human progress.

Pittsburgh is a workshop for the world, the gateway to the great American West, the home of new sights and new experiences, spread over many hills and valleys, served by 1,547 bridges, through country rich in history, spectacular for its industry, and charming over its miles of ever-changing landscape and scenic beauty on the historic "Point" of three rivers—the birthplace of the "Beautiful Ohio."

Proper recreation and play is provided for everyone on 12,000 acres of playgrounds, 40 swimming pools, 75 tennis courts, and half dozen lakes, a zoo, and 38 golf courses—more golf courses than can be found in any other county in the United States.

And in the evening, after sundown, visitors may view the moon in its orbit and the Parade of Stars across the heavens, through the giant eyes of telescopes and cameras of the Allegheny Observatory and in the auditorium of the Buhl Planetarium.

Pittsburgh is for the first time to act as host to the American Public Health Association. You are assured of a warm welcome and a most enjoyable meeting. Reserve October 17–20 on your calendars!

ASSOCIATION NEWS

"This exhibit on Public Health Administration is sponsored by the American Public Health Association."

MEMBERS of the Association visiting the New York World's Fair this year will read this caption on a plaque identifying the exhibit which they have made possible by their contributions.

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HEALTH CONSERVATION CONTESTS

WINNERS OF TENTH ANNUAL CITY HEALTH CONTEST

GROUP I (cities of over 500,000 population), first award, Cleveland, Ohio. Awards of merit in this group go to Buffalo, N. Y.; and Pittsburgh, Pa.

GROUP II (cities of 250,000 to 500,000 population), first award, Providence, R. I. Awards of merit in this group go to Memphis, Tenn.; Louisville, Ky.; Dallas, Tex.; and Cincinnati, Ohio.

GROUP III (cities of 100,000 to 250,000 population), first award, Grand Rapids, Mich. Awards of merit go to Reading, Pa.; Yonkers, N. Y.; and Erie, Pa.

GROUP IV (cities of 50,000 to 100,000 population), first award, Newton, Mass. Awards of merit to Madison, Wis.; and Greensboro, N. C. and Evanston, Ill., tied.

Group V (cities of 20,000 to 50,000 population), first award, Plainfield, N. J. Awards of merit go to Winona, Minn.; Orange, N. J.; and Stamford, Conn.

GROUP VI (cities of less than 20,000 population), first award, Englewood, N. J. Awards of merit go to Hibbing, Minn.; and Virginia, Minn.

In addition, special awards were given to Baltimore, Md.; Brookline, Mass.; Detroit, Mich.; Greenwich, Conn.; Hackensack, N. J.; Hartford, Conn.; Newark, N. J.; New Haven, Conn.; Pasadena, Calif.; Schenectady, N. Y.; and Syracuse, N. Y. Each of these cities has on two or more occasions won first award in its population group and has maintained its previous high standards during 1938.

WINNERS OF THE FIFTH ANNUAL RURAL HEALTH CONTEST

In the Northeastern Division the winner is Cattaraugus County, N. Y. Awards of merit go to Mecosta-Osceola District, Mich.; District 7, Mich. and Saginaw County, Mich., tied; Alger-Schoolcraft District, Mich.; Cortland County, N. Y.; Chippewa County, Mich.; Barnstable County, Mass.; and Berkshire District, Mass.

In the Eastern Division the Winner is Wicomico County, Md. Awards of merit go to Fayette County, Ky.; Mason County, Ky.; Montgomery County, Md.; Jefferson County, Ky.; Scott County, Ky.; Arlington County, Va.; Anderson County, Ky.; Barren County, Ky.; Hamilton County, Tenn.; and Orange-Person-Chatham Health Unit, N. C.

In the Southeastern Division the winner is Charleston County, S. C. Awards of merit go to Lauderdale County, Miss.; Brooks County, Ga.; Berkeley County, S. C.; Macon County, Ala.; and Pickens County, Ala.

In the North Central Division an award of merit goes to Gallatin County, Mont.

In the South Central Division awards of merit go to Dallas County, Tex.; Tyler-Smith County, Tex., and St. Mary's Parish, La.

In the Western Division the winner is Los Angeles County, Calif. Awards of merit go to Wasco County, Ore.; Clallam County, Wash.; Marion County, Ore.; Jackson

County, Ore.; and Spokane County, Wash. and Whitman County, Wash., tied.

Special awards for having won the Rural Health Contest twice in their respective geographical districts and for having maintained their previous high standards of achievement during 1938 go to Davidson County, Tenn.; El Paso County, Tex.; Pike County, Miss., and Shawnee County, Kans.

In the *Canadian Rural Health Contest* the winner is St. Jean-Iberville-Laprairie-Napierville County Health Unit, Quebec. Awards of merit go to Terreboone County Health Unit, Quebec; Rimouski County Health Unit, Quebec; Argenteuil County Health Unit, Quebec; St. James-St. Vital County Health Unit, Manitoba; St. Hyacinthe-Rouville County Health Unit, Quebec; Temiscouata-Riviere du Loup County Health Unit, Quebec; Laviolette County Health Unit, Quebec; Nicolet County Health Unit, Quebec; and Matane County Health Unit, Quebec.

WINNERS OF 1938 SPECIAL CONTESTS

In the 1938 Special Contest for Tuberculosis Control, Hartford, Conn., and Newton, Mass., tied for first place. In addition an award of merit goes to New Haven, Conn.

In the 1938 Special Contest for Syphilis Control the winner is Louisville, Ky.

SPONSOR OF THE CONTESTS

The City Health Contest is financed by a group of life insurance companies.* The Rural Health Contest is financed by the W. K. Kellogg Foundation of Battle Creek, Mich.

The Contest in Canada is sponsored jointly by the Canadian Public Health Association and the American Public Health Association.

Two special contests, one on Tuberculosis and one on Syphilis, are carried on in conjunction with the City Health Contest. Awards are made to those competing cities which appear to have the most comprehensive and effective programs for combating tuberculosis and syphilis.

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* Life insurance companies financing this health project include:

Bankers Life Insurance Company
Bankers National Life Insurance Company
Berkshire Life Insurance Company
Business Mens Assurance Company
California-Western States Life Insurance Company
Capitol Life Insurance Company
Central Life Assurance Society
Franklin Life Insurance Company
General American Life Insurance Company
Great Southern Life Insurance Company
Guardian Life Insurance Company of America
Liberty National Life Insurance Company
Life and Casualty Insurance Company
Lincoln National Life Insurance Company
Massachusetts Mutual Life Insurance Company
Metropolitan Life Insurance Company
Midwest Life Insurance Company
Minnesota Mutual Life Insurance Company
Mutual Trust Life Insurance Company
National Life and Accident Insurance Company
New York Life Insurance Company
Northwestern National Life Insurance Company
Occidental Life Insurance Company
Old Line Life Insurance Company of America
Pacific Mutual Life Insurance Company
Provident Mutual Life Insurance Company
Republic National Life Insurance Company
Reserve Loan Life Insurance Company
Rockford Life Insurance Company
Southwestern Life Insurance Company
Sun Life Insurance Company
Travelers Insurance Company
United Benefit Life Insurance Company
Volunteer State Life Insurance Company
West Coast Life Insurance Company
Western Life Insurance Company

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

A. J. Butler, M.D., C.P.H., Underwood Ave., Clinton, Tenn., Director, Anderson-Campbell County Health District

Marshall C. Keith, M.D., State Health Department, Cheyenne, Wyo., State Health Officer

James A. McCallum, M.D., C.P.H., Centreville, Md., Deputy State Health Officer

William G. Rinehart, M.D., 211 Commerce Bldg., Pittsburg, Kans., City Health Officer

Robert C. Strode, M.D., 220 Clifton Ave., Mount Holly, N. J., District Health Officer

Stamatis G. Velonis, M.D., Nespelem, Wash., Deputy State Health Officer, Colville Indian Reservation

James F. Worley, M.D., Box 1751, Juneau, Alaska, Senior Surgeon, U. S. Public Health Service, and Medical Director for Alaska, U. S. Indian Service

Laboratory Section

Jacob M. Coblentz, M.S., 208 Science, Iowa State College, Ames, Iowa, Research Graduate Assistant

Barton F. Hauenstein, M.D., 2100 City Hall, Buffalo, N. Y., Director of Laboratories, Dept. of Health

Arthur P. Long, M.D., Dr.P.H., 198 Fair Oaks Park, Needham, Mass., Assistant Director, Division of Biologic Laboratories, Massachusetts Dept. of Public Health

Theodore Marcus, M.Sc., 6 Columbia Road, Dorchester, Mass., Director, Massachusetts Dairy Laboratories

Nicholas M. Molnar, M.S., 211 East 19th St., New York, N. Y., Director, Molnar Laboratories, and Director, Stuyvesant Polyclinic Laboratories

Paul V. Woolley, Jr., M.D., 375 South St., Jamaica Plain, Boston, Mass., Assistant Director, Division of Biologic Laboratories, Massachusetts Dept. of Public Health

Vital Statistics Section

Alpha K. Kenny, Box 485, Blountville, Tenn.

Public Health Engineering Section

Ralph M. Davidson, M.S., Weid County Court House, Greeley, Colo., Sanitarian, Weid County Health Unit

Walter F. Garcia, Wailuku, Maui, Hawaii, Sanitary Inspector, Territorial Board of Health

Harry K. Gidley, B.S. in C.E., State Health Dept., Charleston, W. Va., Associate Sanitary Engineer

Irving Reichman, B.C.E., 1855 Bogart Ave., New York, N. Y., Water Inspector, City of New York Dept. of Water Supply

Yale Rosenfeld, B.S., C.P.H., 2207–26th Ave., San Francisco, Calif., Student, University of California

James G. Terrill, Jr., C.E., Graduate House, Massachusetts Institute of Technology, Cambridge, Mass., Student

Barringer F. Wingard, B.S., City Hall, Clinton, S. C., Health Officer

Industrial Hygiene Section

Robert M. Kirk, B.S., 1616 State St., Harrisburg, Pa., Chemist, Division of Industrial Hygiene, Pennsylvania Dept. of Health

Food and Nutrition Section

Milton L. Laing, M.S., Chemical Laboratory, Armour & Company, Chicago, Ill., Assistant Chief Chemist

Helen Stacey, M.A., 82 MacDougal St., New York, N. Y., Nutrition Consultant, Henry Street Visiting Nurse Service

Child Hygiene Section

Robert B. Hightower, M.D., Room 203, District Bldg., Washington, D. C., Assistant Director, School Medical Inspection, Health Dept.

Public Health Education Section

Clennie E. Bailey, Sc.D., 1235 East 14th Ave., Apt. 32, Denver, Colo., Teacher of Hygiene and Public Health, University of Denver

George H. Bischoff, M.D., 709 Pueblo, Boise, Idaho, Director, Maternal and Child Health, State Crippled Children's Division

Mrs. Emily G. Bogert, 581 Gibson St., Akron, Colo., Vice-Commander, Woman's Field Army for Control of Cancer

Rachel S. Browne, 326 Appleton St., Holyoke, Mass., Executive Secretary, Holyoke Tuberculosis Assoc.

Mrs. H. Reed Edmunds, Box 467, Leesburg, Fla., Executive Secretary, Lake County Tuberculosis and Health Assoc.

Milton A. Feinberg, B.S., 411 East 69th St., New York, N. Y., Field Secretary, Committee on Neighborhood Health Development, Dept. of Health

Arthur H. German, B.Sc., 308 Key Bldg., Oklahoma City, Okla., Executive Secretary,

Tuberculosis Society of Oklahoma City

A. Harry Ostrow, D.D.S., 203 District Bldg., Washington, D. C., Director of Dental Services, District of Columbia Health Dept.

Edward W. E. Schear, Ph.D., 107 West Park St., Westerville, Ohio, Head, Dept. of Biology and Geology, Otterbein College

Public Health Nursing Section

Margaret Blee, R.N., University of California, Berkeley, Calif., Instructor of Nursing Education

Lilly Harman, R.N., 1923 East Monument St., Baltimore, Md., Supervising Nurse, Eastern Health District

Viola Heaton, R.N., 2020 Cornell Road, Cleveland, Ohio, Orthopedic Field Nurse, State Crippled Children's Service

Florence V. Illing, R.N., Box 35, St. George, S. C., Rural Field Nurse, State Board of Health

Ruth E. Murphy, 523 So. Oak St., Ukiah, Calif., Field Nurse, U. S. Indian Service

Epidemiology Section

N. Berneta Block, M.D., Michigan Dept. of Health, Lansing, Mich., Public Health Physician III, Bureau of Epidemiology

Ray E. Smith, M.D., Kotzebue Hospital, Kotzebue, Alaska, Physician, U. S. Indian Service

John S. Wheeler, M.D., C.P.H., 116 School St., Concord, N. H., State Epidemiologist and Director, Division of Local Health Work, State Board of Health

Unaffiliated

Robert F. Hall, M.D., 473 Fairfield Road, Ypsilanti, Mich., Public Health Trainee, University of Michigan

Kingsley Roberts, M.D., 5 East 57th Street, New York, N. Y., Medical Director, Bureau of Coöperative Medicine

Henry Perry, Beaver Falls, N. Y., Chief Chemist, J. P. Lewis Company

Bertha Shafer, M.D., 9 East Huron St., Chicago, Ill., Director, Illinois Social Hygiene League

DECEASED MEMBERS

Alfred Larson, M.D., Ph.D., Youngstown, O., Elected Member 1912

A. C. Shamblin, M.D., Cartersville, Ga., Elected Member 1930

Edward J. Howland, M.D., Colchester, Conn., Elected Member 1933

Wendell A. Jones, M.D., Riverside, Calif., Elected Member 1935

EMPLOYMENT SERVICE

The Employment Service will register persons qualified in the public health field without charge.

Replies to these advertisements, when keyed, should be addressed to the American Public Health Association, 50 West 50th Street, New York, N. Y., identifying clearly the key number on the envelope.

Positions Wanted

HEALTH OFFICERS

Unusually well qualified and experienced administrator; M.D., Johns Hopkins; M.P.H., Harvard; with broad experience in administering programs of medical care; is available. **A404**

Physician; M.D., Class A medical school; M.S.P.H., University of Michigan, 1937; now serving as district state health officer; seeks full-time city or city-county administrative position. **A367**

Well qualified physician; with C.P.H. from Johns Hopkins; experienced as school physician and in college teaching; will consider city or county administrative position or teaching and student health. **A383**

Physician; M.D., Vanderbilt University; Dr.P.H., Johns Hopkins; experienced as epidemiologist, health officer and professor of preventive medicine; seeks position as administrator or epidemiologist. **A397**

Physician, aged 30; M.D., University of Illinois; C.P.H., University of California; experienced as instructor in medicine and director of state Division of Epidemiology; desires position in communicable disease control or administration. **A399**

Physician; M.D., C.P.H.; 2 years' experience as district health officer; prefers to do venereal disease control work or epidemiology. **A345**

Well qualified physician, completing course in public health at University of Michigan, with special interests in tuberculosis and venereal disease control, seeks responsible appointment. Excellent references. **A406**

Physician; M.D., University of Minnesota, 1927; M.S., Columbia University, 1937; special training in tuberculosis and venereal disease, and administrative experience in CCC camp; wishes position as health officer. **A407**

Physician; M.D., Yale; M.S.P.H., Columbia; also short course for Health Officers, Vanderbilt; good clinical background; one year public health experience; will consider appointment in child health, epidemiology or public health administration. **A350**

Physician; M.D. degree from Class A medical school. Two years' internship in large city hospital; 14 years' general practice before entering public health activities; 12 years' full-time public health experience. Employed now with state department of health. Will consider opening with well organized city or state department in communicable disease division or epidemiology or both. Mid-west preferred. **A409**

Physician, M.D., class A medical school, M.S.P.H., University of Michigan, 1939. Ten years' experience in administrative full-time health programs. Seeks position in public health administrative position. **A373**

HEALTH EDUCATION

Health educator with excellent background of teaching experience in schools; M.S.P.H. from the University of Michigan in June; wishes a position where skill with educational sound film projection and other recognized technics will be appreciated. **H405**

Experienced director of health education, R.N. and college graduate, with excellent references, will consider health education or promotional position in the East. **A408**

LABORATORY

Physician; M.D., Northwestern; Dr.P.H., Johns Hopkins; broad experience in laboratory, teaching and epidemiological fields; will consider temporary position for summer, beginning in May, preferably in parasitology. **M293**

Physician; C.P.H., Harvard-Technology; experienced as bacteriologist and pathologist and director of state laboratories; desires position. **L208**

Experienced bacteriologist, Ph.D., 1934, with teaching in research background, particularly in relation to sanitation, seeks position as director of laboratory or teacher. **L370**

Experienced woman bacteriologist, Ph.D., University of Illinois 1937, wishes position in teaching or research. Excellent bibliography and references. **L410**

Bacteriologist, M.S. degree, experienced in university teaching, testing antiseptics, bacterial food poisoning, and industrial products, desires a laboratory or allied position. **L411**

Chemist and bacteriologist experienced in water supply, sewage, and public health

laboratory work. Five years' experience. B.S. 1933. Desires work in sanitation or general public health. **L412**

Chemist and Bacteriologist, B.Sc.; A.B.; B.S. in Ed.; M.S.P.H. from University of Michigan. Experience in field work as chemist. Serology training under Dr. Kahn at Ann Arbor, Mich. Three years' experience in public health laboratory work. Will consider position in public health field. **L415**

MATERNAL AND CHILD HEALTH

Woman physician, with excellent medical training and background of public health nursing experience, seeks position in maternity and infancy work. **C376**

Woman physician, graduate of University of Iowa, who has directed state bureau of maternal and child health, now employed, will consider another position. **C318**

ENGINEERING

Public Health Engineer, B.S. in Sanitary Engineering, University of California, 1937. Now completing training for C.P.H. in Public Health Engineering, University of California. Well trained in all phases of sanitation and other public health activities, including epidemiology, public health administration, health education, etc. Desires position as sanitary or public health engineer in municipal, county or state health department. **E413**

MISCELLANEOUS

Experienced librarian in the medical field, with knowledge of the literature, languages, editing, abstracting and reference work, desires position in research or editorial department of a public health organization. Available in the fall. **M414**

Situations Wanted

PUBLIC HEALTH PHYSICIAN—B.S., M.D., degrees eastern schools; CPH, Johns Hopkins School of Hygiene; five years, chief epidemiologist State Department of Health; for further information please write M. Burneice Larson, Director, Medical Bureau, Pittsfield Building, Chicago.

PUBLIC HEALTH NURSE—Graduate of a small school; graduate courses in pediatrics and communicable diseases; nine months' postgraduate training in public health nursing, Western Reserve; several years' successful hospital experience (supervising and executive); five years, public health nursing; for further information please write M. Burneice Larson, Director, Medical Bureau, Pittsfield Building, Chicago.

BACTERIOLOGIST—A.B., M.S., degrees, state university; ten years, city bacteriologist and chemist, city health department; for further information please write M. Burneice Larson, Director, Medical Bureau, Pittsfield Building, Chicago.

SOCIAL WORKER—B.A. and M.A degrees; two years' graduate training, eastern school of social service work; two years, case worker in family department of Catholic charitable organization; field work was served in medical social service; has ability to carry responsibilities; for further information please write M. Burneice Larson, Director, Medical Bureau, Pittsfield Building, Chicago.

Situations Open

WANTED—Director of Health; physician; graduate recognized school of public health, with year's practical experience in public health field; beginning salary $4,000; wealthy residential community, New England. No. PH-55, Medical Bureau, Pittsfield Building, Chicago.

WANTED—Public health nurse to assist supervisor of nurses, municipal public health department; midwest. No. PH-50, Medical Bureau, Pittsfield Building, Chicago.

WANTED—Registered nurse with college degree who has emphasized public health work; small southeastern college; $125, maintenance. No. PH-51, Medical Bureau, Pittsfield Building, Chicago.

WANTED—Graduate nurse-technician; college infirmary; 8-hour day, 5½ day week; month's paid vacation; $1200–$1400; midwest. No. PH-52, Medical Bureau, Pittsfield Building, Chicago.

WANTED—Qualified public health physician for immediate appointment as district health officer, midwestern state. No. PH-53, Medical Bureau, Pittsfield Building, Chicago.

WANTED—High school nurse, with degree, public health training; 5-day week, regular teaching hours; Chicago vicinity. No. PH-54, Medical Bureau, Pittsfield Building, Chicago.

NEWS FROM THE FIELD

THE NATIONAL HEALTH ACT OF 1939

A SUMMARY OF THE WAGNER BILL BEFORE THE U. S. CONGRESS

SENATOR Robert F. Wagner of New York has introduced the National Health Act of 1939 (S. 1620). The following is a summary of the main provisions of the Bill:

The National Health Act is intended to implement with concrete legislation the recommendations developed out of a 5 year inquiry recently reported by the Inter-departmental Committee to Coördinate Health and Welfare and other federal agencies.

The Bill utilizes the procedure of grants-in-aid from the federal government, familiar in various titles of the Social Security Act, which provides latitude to the states in the development of their own plans. In this Bill grants are made available for the purpose of establishing, expanding, and approving state programs for child and maternal health, for general public health and investigation, for the construction of needed hospitals and health centers, for general programs of medical care, and for insurance against loss of wages during periods of temporary disability. Federal administration is broken up between the Children's Bureau, the Public Health Service, and the Social Security Board.

Contrary to a general impression, there is no provision in the Act authorizing the federal government to furnish medical care. Administration in all cases is to be through the states, with a view to supplementing the existing efforts of the professions, the localities, charitable organizations, and hospitals. The Bill does not establish a system of health insurance or require the states to do so. However, the states will be free to develop plans of their own choosing, subject to the establishment of necessary basic standards. Plans for medical care may be limited to those on relief or they may include others more fortunately situated and may be paid for by insurance contributions, by general revenue, or both. The method and scope of medical services are for the states to determine and they may include services rendered through existing private agencies or institutions.

Provision is made for participation by the federal government only where there is financial participation by the state. The state must provide either a state-wide program at the outset or plans for extension so that the program will be in effect in all political subdivisions of the state in need of the services not later than June 30, 1945. Except for the grants for disability compensation, the administration of the plan is to be by the state health agency, or at least there is to be supervision by the state health agency of any part of the plan administered by another state agency or by a political subdivision of the state.

The federal administrative officers may require the states to establish personnel standards on a merit basis and methods of establishing and maintaining standards of medical and institutional care and of remuneration for such care to be prescribed by the state agency after consultation with profes-

sional advisory committees. At each stage of state and federal administration provision is made for consultation with professional advisory councils composed of members of the professions and agencies, public and private, that furnish the particular services.

Federal grants are made available for the professional training of administrative and technical personnel. It is also required that the states provide for necessary working agreements between state administrative agencies concerned with various aspects of social insurance, public assistance, workmen's compensation, vocational rehabilitation, industrial hygiene and education.

The new appropriations authorized in the first year for all phases of the program, including the administrative costs, aggregate approximately $80,000,000, exclusive of amounts which may be appropriated by Congress for aiding the states in the construction of needed tuberculosis and mental hospitals. This sum under the Bill will be gradually increased over a 10 year period and will be available to match sums appropriated by the states toward the cost of their respective programs. No new federal payroll taxes are authorized.

In order to make the available funds serve the interest of those localities which are in greatest need of the services, the Bill authorizes grants on a variable matching basis, depending on the relative financial resources of the several states, as determined by the per capita income of their inhabitants. The federal grants will vary from 33⅓ per cent to 66⅔ per cent of the total sums expended by the states for various programs of public health and hospital construction. For programs of medical care, the matching ratio varies from 16⅔ per cent to 50 per cent of total state expenditures. The intent of this provision is to raise the general level of health protection throughout the country, while reducing the existing wide variations among the states, and especially as between rural and urban areas.

In addition to various preventive and curative health services, the Bill authorizes grants-in-aid to states in establishing insurance plans providing cash benefits during periods of temporary disability. These insurance systems would protect the wage earner against an annual wage loss through disabling illness estimated to be more than $1,000,000,000 per year. Federal grants for this purpose are authorized at a fixed matching ratio of 33⅓ per cent of the total expenditures by the states.

Under this Bill the Children's Bureau is charged with the administration of grants for maternal and child welfare and for services to crippled and other physically handicapped children. The Public Health Service is charged with the administration of grants for general public health work and investigations and for hospitals and health centers. The grants for medical care and for disability compensation are to be administered by the Social Security Board.

SUMMER SCHOOL COURSES IN PUBLIC HEALTH

While the following list does not show all universities and technical schools offering summer courses in public health, it represents those who have replied to a questionnaire sent out by the American Public Health Association.

American National Red Cross

Courses in Teacher Training for Home Hygiene Instruction:

University of California, Los Angeles, Calif.—June 26–August 4
Colorado State College, Fort Collins, Colo.—July 8–August 18
Peabody College, Nashville, Tenn.—June 12–August 25

University of California, Berkeley, Calif.

June 26–August 4

General Bacteriology
Child Development
Physiology of the Growth and Development of Children
Administration of the School Health Program
Child Psychology
Nursing and Social Problems in the Control of Syphilis and Gonorrhea—3 weeks' institute, June 26–July 14—under auspices of University of California and the State Department of Public Health
Introduction to Educational Psychology
General Psychology
Elementary Epidemiology *
Elementary Public Health *
Applied Hematology and Other Diagnostic Procedures *

* These four courses are offered in the Intersession, May 15–June 23

University of California at Los Angeles, Los Angeles, Calif.

June 26–August 4

Elementary Bacteriology
Growth and Development of the Child
Adolescence
Child Guidance
Mental Hygiene
The Nursery School
Administration of the School Health Program
Administration, Supervision, and Teaching of Sight-Saving Classes
Recreational Leadership
Physiology of Exercise
Principles of Teaching as Applied to Home Hygiene Courses
Methods in Teaching Home Hygiene Courses with Practice Teaching
Essentials of Nutrition
Family Relationships
General Psychology
Child Psychology
Educational Psychology
Materials for Health Instruction in the Secondary School
Public Health and Preventive Medicine
Principles and Practice of Public Health Nursing
Social Case Work as Related to Public Health Nursing
General Human Physiology
General Zoölogy
Psychological Adjustment
Social Pathology

The Catholic University of America, Washington, D. C.

June 30–August 12

Child Study
Nursing Education
Public Health Nursing
Social Work
Sociology

Teachers College, Columbia University, New York, N. Y.

June 5–27

Curriculum in Health Education
Field Work in Health Education
Health Service in Schools

July 5–August 11

Administration of Health Education in Public Schools: Principles and Special Problems in Health Education; Methods and Materials of Health Instruction in Schools and Colleges

Child Hygiene
Health Education
Health and Physical Education
Recreation
Health Care of Children
Home and Community Hygiene
Nutrition and Health
Personal and General Hygiene
Public Health Nursing
Public Health Administration
School Hygiene
School Nursing
Education of the Handicapped:
Demonstration Classes
Observation, Practice Teaching, and Clinical Work
Survey of Ear, Orthopedic, Cardiac, and Certain Tuberculous Conditions, and of Certain Types of Malnutrition
Education of the Blind and Partially Seeing (beginning and advanced courses)
Education of the Deaf (advanced courses only), and of the Hard of Hearing (beginning and advanced courses)
Education of the Crippled and Other Motor Handicapped
Education of the Mentally Handicapped
Education of the Socially Handicapped
Speech Correction
Psychology of Physically Handicapped Children
Music and Rhythms for the Handicapped
Physical Education for the Physically and Mentally Handicapped

Cornell University, Ithaca, N. Y.

July 3–August 12

Health Education:
The School Health Program
Mental and Physical Health Problems of the School Child
Mental Hygiene

University of Denver, Denver, Colo.

June 19–August 25

Conference on Health and Physical Education, July 11, 12, 13

Duke University, Durham, N. C.

June 12–July 22

Materials and Methods in Health Education
Mental Hygiene of the School Child
Personal and School Hygiene

Harvard University—Medical School, Boston, Mass.

June 19–August 5

Physiotherapy (course for graduates)

The University of Hawaii, Honolulu, Hawaii

June 26–August 4

Health of the School Child
Organization and Administration of Health and Physical Education
Health Education in the Public Schools

University of Illinois, Urbana, Ill.

June 19–August 12

Agricultural Engineering:
Drainage and the Mechanics of Soil and Water Conservation
Bacteriology:
Food and Applied Bacteriology
Entomology:
How Insects Live and Their Importance to Mankind
Home Economics:
Nutrition
Dietetics
Foods
Organization and Management of the Home
The Child and His Development
Physical Education for Men:
Physical Education
Problems in Physical Education
Problems in School Health
Safety Education
Training and First Aid
Physical Education for Women:
Physical Education
Physical Education Program for the High School
Playground Activities for Elementary Schools
Health Education in the High School
Sociology:
Community Welfare Organization

State University of Iowa, Iowa City, Iowa

June 12–August 4

Hygiene
Nursing
Nutrition
Physical Education

University of Kentucky, Lexington, Ky.

June 12–August 5

Health Officers:
Epidemiology
Public Health Administration
Vital Statistics
Public Health Records
Maternal and Child Health

Mental Hygiene
County Health Practice
Public Health Bacteriology
Chemistry of the Vitamins
Contemporary Problems in Political Science
Sanitary Engineering
Public Health Nurses:
Public Health
Public Health Nursing
Deficiency Diseases and Nutrition
Social Work Information
Elementary Psychology
Sanitarians:
General Bacteriology
General Animal Biology
Mechanical Drawing
Communicable Diseases
Sanitary Engineering

Loyola University, Chicago, Ill.

June 26–August 5

Public Health Nursing in Special Fields
Applied Public Health Nutrition
Physiologic Hygiene
Methods and Materials in Health Education
Principles of Public Health Nursing
Principles of Social Case Work as Applied to Public Health
School Health Problems
Principles of Sociology
Educational Psychology
Mental Hygiene (3 courses)
Eye Hygiene and Oral Hygiene

Massachusetts Institute of Technology, Cambridge, Mass.

Bacteriology (July 3–July 21)
Public Health Bacteriological Methods (June 12–July 21)
Food Technology (Sept. 5–Sept. 22)
Modern Biology (June 26–August 4)

Massachusetts State Teachers College, Hyannis, Cape Cod, Mass.

(Sponsored by the Division of Child Hygiene of the Massachusetts Department of Public Health, in coöperation with the State Department of Education)

July and August

Source Materials for the Development of a School Health Program
Principles and Methods of Teaching Health
Prevention and Correction of Reading Difficulties

Michigan State College, East Lansing, Mich.

June 19–July 28

General Bacteriology
Medical Biology Courses
Pathological Bacteriology
Personal Hygiene
Sanitary Science
Physical Education Departments offer the following courses:
School Health Problems
First Aid

University of Michigan, Ann Arbor, Mich.

June 26–August 5

Child Hygiene
School Health Problems
Principles of Public Health Nursing
Administration and Organization of Public Health Nursing
Applied Nutrition
Methods and Materials of Health Education
Mental Hygiene
Supervision of Public Health Nursing
Physiologic Hygiene
Communicable Diseases and Epidemiology
Public Health Statistics
Public Health Law and Administration
Sanitation
Industrial Hygiene

August 14–26

National Institute for Traffic Safety Training

University of Minnesota, Minneapolis, Minn.

First Term, June 19–July 28; Second Term, July 31–September 1

Public Health Nursing Courses
First Term:
Elements of Preventive Medicine and Public Health
Nursing and Social Problems in the Control of Gonorrhea and Syphilis
Tuberculosis and Its Control
Field Practice with Family Health Agency
Public Health Administration and Field Work
Public Health Administration—General Research
Special Methods and Supervised Practice in Health Teaching

Courses in Biometry:
Biometric Principles
Topics in Biometry
Second Term:
Health of the School Child
Tuberculosis and Its Control
Principles of Public Health Nursing
Public Health Administration and Field Work
Research

National Society for the Prevention of Blindness, 50 West 50th Street, New York, N. Y.
(in coöperation with the following colleges and universities)

Courses for the Training of Teachers and Supervisors of Sight-saving Classes:
Western Reserve University, Cleveland Ohio
June 19–July 28
State Teachers College, Buffalo, N. Y.
June 26–August 4 (dates tentative)
State Teachers College, Milwaukee, Wis.
June 26–August 4
University of California, Los Angeles, Calif.
June 26–August 4
Wayne University, Detroit, Mich.
June 26–August 4 (elementary and advanced courses)

University of New Mexico, Albuquerque, N. M.

July–August

Social Hygiene
Methods and Materials in Health Education
Hygiene of Adult Life, Degenerative Diseases

New York University, New York, N. Y.

July 5–August 11

Course of six weeks, preparing for reconstruction work with the physically handicapped.

Summer course, to be given at New York University Camp, Sloatsburg, N. Y., under the auspices of New York University, Summer Session of the School of Education.

Information can be secured from Dr. Walter J. Craig, Director of the Division of Orthopedics, New York State Department of Health, and from New York University, New York, N. Y.

New York University, New York, N. Y.

Intersession: June 5–30
Summer Session: July 5–August 11

Nursing Education:
Administration of Public Health
Organization of School Nursing
Teaching of Home Nursing and Home Hygiene
Principles of Public Health Nursing
Applied Nutrition for Health Supervisors
Care of Mothers and Infants
Teaching in Nursing Education
Psychology of Childhood—Adolescence
Child Hygiene
Principles and Practices in First Aid

Northwestern University, Evanston, Ill.

June 19–August 12

Teaching Rhythms to Children
Foundations of a Philosophy of American Recreation
Administering the Physical Education Program for Health
Preventive and Corrective Physical Education
Eye Health of the School Child
Seminar in Eye Health in Teacher Education

Rutgers University, New Brunswick, N. J.

July 5–August 16

Public Health Practice
Principles of Public Hygiene

Smith College—School for Social Work, Northampton, Mass.

July 5–August 30

Medical Information

Stanford University, Stanford University, Calif.

June 22–September 2

Physical Education and Hygiene

Syracuse University, Syracuse, N. Y.

July 5–August 11

Principles of Public Health Nursing
Maternity and Child Hygiene
Special Fields in Public Health Nursing
Public Health and Statistics
Case Studies in Public Health Nursing
Ward Management
Teaching of Nursing Arts

Psychology (Child, Adolescent, Educational)
Nutrition
Hygiene Methods

Temple University, Philadelphia, Pa.
Teachers College—Department of Physical and Health Education

June–July

Administration of Health Education

University of Tennessee, Knoxville, Tenn.

June 12–July 19

Bacteriology
Water Supply
Child Psychology
Home Nursing
Nutrition
School Lunchroom Management
Personal Hygiene—Group Hygiene
Public Health Education

July 20–August 24

School and Mental Hygiene
Water Supply
Nutrition
Child Guidance
Young Child and His Family
Public Health Education

University of Utah, Salt Lake City, Utah

June 12–July 21

Bacteriology
Biology
Chemical Research
Problems in Child Development
Guidance and Personnel in Secondary Schools
Physical Education and Hygiene
Home Economics
Social Work
Home Nursing
Introduction to Public Health
Personal Health and Its Teaching
Principles of Child Welfare

Vassar College, Poughkeepsie, N. Y.

June 29–August 9

Institute of Euthenics:
Special Work in Guidance and Science (for secondary school teachers)

University of Virginia, University, Va.

June 19–July 29

Hygiene and Sanitation

Wagner College, Staten Island, N. Y.

July 5–August 15

Bacteriology
Applied Bacteriology
Serology
Clinical Pathology
Seminar in Medical Technology

Washington University, St. Louis, Mo.

June 16–July 28

Education
Natural Sciences
Psychology
Sociology and Social Work

University of Washington, Seattle, Wash.

June 19–July 19 (First Term)
July 20–August 18 (Second Term)

Diagnostic and Remedial Work in Education
Behavior as an Expression of Health
Nutrition
Bacteriology
Organization, Administration, and Techniques in Special Fields of Public Health Nursing
Public Health Administration and Epidemiology
Readings in Specialized Fields of Public Health Nursing
Principles of Teaching Nursing and Health
Principles of Health Education
Methods and Materials in Health Teaching
Symposium in Health Education
Public Health Program

Wayne University, Detroit, Mich.

June 26–August 4

Psychology
Sociology

University of West Virginia, Morgantown, W. Va.

June 12–August 26

First Term:
Problems in Health and Physical Education
Tests in Health and Physical Education
Advanced Public-School Health
Seminar in Health and Physical Education

Second Term:
Problems in Health and Physical Education
Tests in Health and Physical Education
Seminar in Health and Physical Education

Western Reserve University—School of Applied Social Sciences, Cleveland, Ohio

June 19–July 28

Public Health Nursing:
Practical Sociology
Public Welfare
Rural Communities

University of Wisconsin, Madison, Wis.

June 26–August 4

Curriculum in Physical Education for Junior and Senior High School Girls
First Aid and Safety Education
Health Education in Schools
Human Anatomy
Medical Bacteriology
Physical Examinations and Therapeutics
Play, Recreation and Leisure Time Problems
Physical Therapy
School Health and Hygiene
Tests and Measurements in Physical Education
Therapeutic Gymnastics
Organization and Administration of a City Recreation Program
Organization of the Extra-curricular Physical Education Program in the Public Schools
Physical Education for Junior and Senior High School Girls

FOREIGN

Carlo Forlanini Institute, Rome, Italy

July 15–October 15

Course of Phthisiology (under direction of Professor Eugenio Morelli)

Ettore Marchiafava Institute of Malariology, Rome, Italy

July 24–September 20

International Malaria Course for 1939 (under direction of Professor Giuseppe Bastianelli)

[For information on these two courses, write to the Medical & Health Dept., I.R.C.E., Via Lazzaro Spallanzani 1A, Rome.]

NATIONAL CONFERENCE FOR COÖPERATION IN SCHOOL HEALTH EDUCATION

RECOGNITION of the opportunities for developing more comprehensive and better coördinated programs of school health education throughout the United States culminated in a 2 day conference of some 70 delegates of 40 national organizations at Rockefeller Center, New York, N. Y., in November, 1938. Preliminary plans for the conference were developed by representatives of the National Education Association, the U. S. Public Health Service, the American Social Hygiene Association, and the National Health Council. Reports from delegates gave a colorful picture of the variety of ways that different organizations operate, of the wealth of diversified services, of the many groups served, and of the difficulties which hinder full attainment of objectives.

Members of the conference stressed the importance of health education in the entire community and the desirability of interrelating school health education and public health education. There are many national health and educational agencies already well organized for service in the health field. From this preliminary conference there resulted a plan for the organization of a National Conference for Coöperation in School Health Education. "To meet more effectively the recognized needs of the schools . . . for making the resources of all agencies more readily available through coördination of efforts."

An executive committee is in the process of organization, and operating codes have been tentatively drawn for the guidance of the executive committee and of the National Conference to be composed of representatives selected by the national agencies represented at

the first Conference and others to be added. These plans will be submitted in the near future for the consideration of the participating agencies. The chairman of the Conference during these stages of organization is Professor Ira V. Hiscock of Yale University, President of the National Health Council; and the secretary is Dr. N. P. Neilson, Executive Secretary of the American Association for Health, Physical Education and Recreation, a department of the National Education Association.

WPA TO BUILD HEALTH DEPARTMENT LABORATORIES IN ILLINOIS

ACCORDING to a recent announcement, 20 laboratories will be constructed by the WPA for the Illinois State Department of Health.

Subject to federal approval, the laboratories will be situated where facilities are inadequate and will not compete with or duplicate existing public or private laboratories. They are not to be used for treatment.

PACIFIC SCIENCE CONGRESS

THE National Research Council has announced that the Sixth Pacific Science Congress will be held under its auspices in San Francisco and vicinity between the dates July 24 and August 12.

Certain of the sessions will be held on the grounds of the Golden Gate International Exposition, certain on the campus of Stanford University near Palo Alto and certain sessions on the University of California campus at Berkeley. The meetings of the Western Branch of the American Public Health Association will be held during part of this period, July 23–28, in Oakland.

Dean Charles B. Lipman of the University of California, Berkeley, is the Chairman of the Committee of the Pacific Science Congress.

ROBERT WILLIAM PHILIP

THE February issue of *Tubercle* carries a notice of the death of Robert William Philip.

"The death of Sir Robert Philip marks an epoch in the history of the anti-tuberculosis campaign. He must surely be regarded as a leader in a public health crusade."

Lady Philip died suddenly in Edinburgh within a month of her husband's death.

RED CROSS MEDICAL ADVISORY COMMITTEE ON HEALTH ACTIVITIES

CREATION of a Medical Advisory Committee to the American Red Cross is announced by Chairman Norman H. Davis.

Dr. Livingston Farrand of New York, who was chairman of the Central Committee of the American Red Cross from 1919 to 1921, has accepted chairmanship of the new committee. Other members are:

Dr. Thomas Parran, Surgeon General of the United States Public Health Service

Dr. Waller S. Leathers, Dean of the Medical School of Vanderbilt University, Nashville, Tenn.

Dr. David P. Barr, Professor of Medicine, Washington University School of Medicine, St. Louis, Mo.

Dr. Martha M. Eliot, Assistant Chief of the Children's Bureau, Washington, D. C.

Rear Admiral Ross T. McIntire, Surgeon General of the U. S. Navy

Major General Charles R. Reynolds, Surgeon General of the U. S. Army

Dr. Edwards A. Park, Pediatrician-in-Chief of Johns Hopkins Hospital, Baltimore, Md.

PENNSYLVANIA REQUIRES CANCER AND DIABETES CASES REGISTERED

A NEW regulation requiring the registration of cancer and diabetes cases has been announced by the Pennsylvania State Health Department.

These two diseases must be reported in the same manner as communicable diseases, and results of treatment, if any, must be included in the report.

VOCATIONAL GUIDANCE FOR PUBLIC HEALTH NURSES

THE Nursing Bureau of Manhattan and Bronx, Inc., New York, N. Y., opens a vocational-placement service to public health nurses and the field on May 1, 1939. The service has the tentative approval of the Committee on Vocational Counseling of N.O.P.H.N. Full approval is dependent upon analysis of the service in action.

Letha Allen, R.N., formerly Director of the Public Health Nursing Organization of Eastchester, Tuckahoe, N. Y., has been appointed Secretary of Public Health Placements. The Nursing Bureau of Manhattan and Bronx, Inc., has been conducting a placement-vocational service for private practice and institutional nurses since 1933. The service to public health nurses and nursing organizations is now added because a need for it in New York City was created when the public health nursing service rendered by Joint Vocational Service in New York City was transferred last July to the Nurse Placement Service in Chicago.

All grades of positions will be handled, the service covering the entire United States.

TEACHING HEALTH CENTER AT COLUMBIA UNIVERSITY

THE opening of the new laboratories and classrooms of the De Lamar Institute of Public Health at the Presbyterian Columbia Medical Center, 168th St. and Broadway, New York, N. Y., has been announced by Dean Willard C. Rappleye, Dean of the Columbia University College of Physicians and Surgeons. The building has been erected through an agreement between the Presbyterian Hospital, Columbia University, and the New York City Department of Health and will serve the Washington Heights and Riverside Districts of the Borough of Manhattan.

This building is one of five similar health centers in New York City through which the health department will provide facilities whereby medical students can participate actively in all phases of public health work, including epidemiology, nursing service, supervision of school children and coöperation with social welfare agencies.

The first four floors of the center will be used by the city as headquarters for maternal care, child welfare, nursing and other public health services. Upper floors will include equipment for the institute and will contain a model classroom with provisions for controlling temperature, volume, humidity, the character of dust and the bacterial content of the air.

BIOLOGICAL ABSTRACTS

ANSWERING the demand from many scientists, *Biological Abstracts*, beginning with the January, 1939, issue, has been separated into individual sections, so that persons may now subscribe to whichever sections interest them. In addition, the complete form will continue to be published. Section C—*Abstracts of Microbiology, Immunology and Parasitology*, which will be of most interest to public health workers, includes immunology, bacteriology, viruses, parasitology, protozoology and helminthology. The index to the complete volume is included with each section.

INCUBATOR SERVICE

INCUBATOR service for premature infants has been inaugurated at the Red Hook-Gowanus Health Center of the New York City Health Department. As part of the program to lower the infant death rate, four portable incubators have been purchased, and letters have been sent to physicians residing in this district informing them of the service.

PERSONALS

Central States

FILIP C. FORSBECK, M.D.,* formerly Associate Director of the Michigan Bureau of Communicable Disease, Lansing, has entered the Reserve Corps of the U. S. Public Health Service with the rank of surgeon. He will be stationed in Cincinnati where he will be engaged in work on the epidemiology of gastro-enteritis, complementing the work of the Stream Pollution Investigations Station. Dr. Forsbeck is Secretary of the Epidemiology Section of the A.P.H.A.

C. D. HART, M.D., C.P.H.,* Director of District Department of Health No. 6, Newberry, Mich., has been appointed Health Officer of the City of Savannah, and Chatham County, Ga.

DR. JOHN A. MCINTYRE has been appointed Health Officer of Owatonna, Minn., succeeding the late DR. JEROME F. SMERSH.

DR. DENNIS M. O'DONNELL has been appointed Health Officer of Ortonville, Minn.

Eastern States

LIEUTENANT-COLONEL A. P. HITCHENS, M.C., U.S.A.,* now assigned to the University of Pennsylvania Medical School, Philadelphia, has been appointed by permission of Secretary Woodring, of the War Department, as George S. Pepper Professor of Public Health and Preventive Medicine at the University of Pennsylvania. For the present Dr. Hitchens will be in charge of the undergraduate and graduate teaching in Public Health and Preventive Medicine, in addition to the courses in Military Medicine.

DR. JOHN J. SHAW, of Philadelphia, Pa., has been appointed State Secretary of Health of Pennsylvania, to succeed DR. EDITH MCBRIDE-DEXTER.

DR. GEORGE S. STEVENSON has been appointed Medical Director of the National Committee for Mental Hygiene, New York, N. Y. He succeeds DR. CLARENCE M. HINCKS, who has asked to be relieved of his duties except as part-time Field Consultant, in order to give more time to the work of the National Committee for Mental Hygiene of Canada, of which he is the General Director and Founder.

DR. ALEXANDER HAMILTON STEWART, of Indiana, Pa., has been appointed Deputy Secretary of Health of Pennsylvania.

Southern States

LIVINGSTON L. BLAIR, of Washington, D. C., has been appointed Assistant National Director of the Junior Red Cross.

DR. JOHN W. DABBS, of Geneva, Ala., has been appointed Health Officer of Geneva County, succeeding DR. WALTER J. BROAD, who has resigned to accept a position in the Division of Venereal Diseases, Alabama State Department of Health.

DR. ROBERT H. HIGHTOWER, who has been instructor in pediatrics under the auspices of the department of clinical and medical education of the Medical Society of Virginia, has resigned to accept a position as Assistant Director of School Medical Inspection in the District of Columbia.

JOSEPH A. MORRIS, M.D.,† of Franklinton, N. C., recently retired as Health Officer of Granville County, after about 20 years of service.

DR. BALLARD L. NORWOOD, JR., now serving at a CCC camp at Greenwood, S. C., has been appointed Health Officer of Granville County, N. C., to succeed JOSEPH A. MORRIS,

* Fellow A.P.H.A.
† Member A.P.H.A.

M.D.,† resigned. Dr. Norwood will take a course in public health at the University of North Carolina before assuming the position July 1.

DR. HENRY E. SIGERIST, Director of the Institute of Medicine, Johns Hopkins University School of Medicine, Baltimore, Md., will lecture during August, September, and October in universities of the Union of South Africa, under a visiting lectureship.

Western States

DR. EDWIN L. BRUCK has been appointed a member of the advisory council to the San Francisco Department of Health, San Francisco, Calif., succeeding DR. WILLIAM C. VOORSANGER.

JOHN M. COLLINS, M.D.,† Seattle, Wash., Acting Health Officer, King County, Wash., resigned March 24, 1939, to accept appointment as First Lieutenant, Medical Corps, Regular Army.

DR. WENDELL H. HUTCHENS, of Portland, Ore., was recently appointed a new member of the Oregon State Board of Health.

DR. CORNELIUS MARTIN MILLS, of Oakland, Calif., has been appointed Chief of the Crippled Children's Services of the California State Department of Public Health. He will have charge of the Department's activities under the California Crippled Child Act and those for the relief of the physically handicapped made possible through the provision of social security funds.

FREDERICK D. STRICKER, M.D.,* of Portland, Ore., was elected Executive Secretary and State Health Officer of the State Board of Health at a recent meeting.

DR. HARVEY A. WOODS, of Ashland, Ore., was appointed a new member of the Oregon State Board of Health.

Canada

JOHN J. HEAGERTY, M.D., D.P.H.,† Chief Executive Assistant of the Department of Pensions and National Health, Ottawa, Ont., has been appointed Director of Public Health Services of Canada.

Foreign

DR. ROBERTO BACHI, medical statistician and economist, formerly professor of Economics at the University of Rome but now exiled from Italy, has been appointed to the staff of the new Medical Center on Mt. Scopus, Jerusalem, Palestine.

DR. EMILIO ENRICO FRANCO, former Professor of Pathological Surgery and Anatomy at the Royal University of Pisa, exiled from Italy, has been appointed to the staff of the new Medical Center on Mt. Scopus, Jerusalem, Palestine.

DR. LUDWIG HALBERSTAEDTER, exiled from Italy, has become associated with the Hadassah Medical Organization in Palestine, Jerusalem.

PROFESSOR BERNHARD ZONDEK, co-discoverer of the Ascheim-Zondek test, is exiled from Italy, and has become associated with the Hadassah Medical Organization in Palestine, Jerusalem.

DEATHS

DR. JAMES MORSELL GASSAWAY, Senior Surgeon, retired, of Cairo, Ill., died March 5, at the age of 91. He was the oldest member of the U. S. Public Health Service, and was associated with the Service for 63 years.

JACOB G. LIPMAN, PH.D.,* of the Experiment Station, New Brunswick, N. J., died April 19.

CHARLOTTE A. STICKNEY, M.D.,† Pediatrician, Division of Child Hygiene, Minnesota Department of Health, St. Paul, Minn., died February 26.

* Fellow A.P.H.A.
† Member A.P.H.A.

CONFERENCES AND DATES

American Academy of Tuberculosis Physicians. St. Louis, Mo. May 13–14.

American Association of Industrial Physicians and Surgeons—24th Annual Meeting. With the American Conference on Occupational Diseases and Industrial Hygiene. Hotel Statler, Cleveland, Ohio. June 5–8.

American Association on Mental Defect — 63rd Annual Convention. Palmer House, Chicago, Ill. May 3–6.

American Dietetic Association—22nd Annual Meeting. Hotel Ambassador, Los Angeles, Calif. August 27–31.

American Heart Association. St. Louis, Mo. May 12–13.

American Home Economics Association—32nd Annual Meeting, Gunter Hotel, San Antonio, Tex. June 20–23.

American Library Association. Exposition Auditorium, San Francisco, Calif. June 18–24.

American Medical Association, 90th Annual Meeting. St. Louis, Mo. May 15–19.

American Psychiatric Association. Chicago, Ill. May 8–12.

American Public Health Association. 68th Annual Meeting. Hotel William Penn, Pittsburgh, Pa. October 17–20.

American Public Welfare Association, Buffalo, N. Y. June 20–22.

American Radium Society. St. Louis, Mo. May 15–16.

American Rheumatism Association. St. Louis, Mo. May 15.

American Society for Clinical Investigation. Atlantic City, N. J. May 1.

American Society for the Study of Allergy. St. Louis, Mo. May 15–16.

American Society of Civil Engineers—Summer: San Francisco, Calif., July 26–29. Fall: New York, N. Y., September 4–9.

American Society of Clinical Pathologists. St. Louis, Mo. May 12–14.

American Society of Heating and Ventilating Engineers. Semi-Annual Meeting 1939 (Great Lakes Summer Meeting). Grand Hotel, Mackinac Island, Mich. July 4–6.

American Therapeutic Society. St. Louis, Mo. May 12–13.

American Water Works Association—59th Annual Meeting. Ambassador Hotel, Chelsea Hotel, Atlantic City, N. J. June 11–15.

Pacific-Northwest Section. Tacoma, Wash. May 18–20.

Arizona Public Health Association. Phoenix, Ariz. May 5–6.

Association for the Study of Internal Secretions. St. Louis, Mo. May 13–14.

Association of American Physicians. Atlantic City, N. J. May 2–3.

Association of Dairy, Food and Drug Officials of the United States—43rd Annual Conference. Hartford, Conn. September 26–29.

Association of Military Surgeons of the United States. Washington, D. C. May 8–10.

Building Officials Conference of America. Detroit, Mich. May 1–5.

Central Atlantic States Association of Dairy, Food and Drug Officials. McAlpin Hotel, New York, N. Y. May 18–19.

Civil Service Assembly—Eastern Regional Conference. Asbury Park, N. J. June 14–17.

Connecticut Public Health Association. New Haven, Conn. May 23.

Florida Public Health Association. Jacksonville, Fla. December.

Food Technology Conference. Under auspices of the Division of Food Technology and Industrial Biology, of the Massachusetts Institute of Technology. Cambridge, Mass. June 28–July 1.

Health Officers and Public Health Nurses—Annual Conference. Grand Union Hotel, Saratoga Springs, N. Y. June 27–29.

International Association for Identification. Tulsa, Okla. September 11–14.

International Cancer Congress—Third. Haddon Hall Hotel, Atlantic City, N. J. September 11–16.

International College of Surgeons—Biennial Assembly. Hotel Roosevelt, New York, N. Y. May 21–24.

International Congress of Microbiology—Third. Waldorf-Astoria Hotel, New York, N. Y. September 2–9.

International Congress of Military Medicine and Pharmacy — Tenth (First meeting of this Congress, organized at the close of the World War, in the Western Hemisphere.) Hotel Willard, Washington, D. C. May 7–15.

May Day—Child Health Day. May 1.

Medical Library Association. Hotel Douglas, Newark, N. J. June 27–29.

Michigan Public Health Association. Lansing, Mich. November 1–3.

National Conference of Social Work. Buffalo, N. Y. June 18–24.

National County Officers' Association. Ogden, Utah. July 17–19.

National Education Association, and affiliated organizations. San Francisco, Calif. July 2–6.

National Gastroenterological Association. New York, N. Y. June 1–2.

National Hospital Day. May 12.

National Institute for Traffic Safety Training (Second). University of Michigan, Ann Arbor, Mich. August 14–26.

National Tuberculosis Association. Hotel Statler, Boston, Mass. June 26–29.

New York State Association of Public Health Laboratories. 23rd Annual Meeting. Grasslands Hospital, Valhalla, N. Y. May 8.

Ohio Federation of Public Health Officials. Columbus, Ohio. May 19.

Pacific Science Congress—Sixth. Under the auspices of the National Research Council. Oakland, Calif. July 24–August 12.

Pan-Pacific Surgical Association—Third Congress. Honolulu, T.H. September 15–28.

Smoke Prevention Association. Milwaukee, Wis. June 13–16.

South Carolina Public Health Association. Myrtle Beach, S. C. May 29–June 1.

Southern California Public Health Association. Long Beach, Calif. January 24, 1940.

Special Libraries Association. Lord Baltimore Hotel, Baltimore, Md. May 23–27.

State Charities Aid Association's State and Local Committees on Tuberculosis and Public Health. Hotel Roosevelt, New York, N. Y. May 11–12.

Symposium on Virus and Rickettsial Diseases—short course of lectures, clinics, and demonstrations, with special emphasis on public health significance. Harvard School of Public Health, Boston, Mass. June 12–17.

Texas Public Health Association. Galveston, Tex. October 2–4.

West Virginia Public Health Association. Hotel Fairmont, Fairmont, W. Va. November 8–10.

Western Branch, A.P.H.A. Tenth Annual Meeting. Hotel Oakland, Oakland, Calif. July 23–28.

Canada

Canadian Public Health Association—28th Annual Meeting. In conjunction with the 25th Annual Conference of the Ontario Health Officers Association. Royal York Hotel, Toronto. June 12–14.

International Hospital Association. Toronto. September 19–23.

American College of Hospital Adminis-

trators. Toronto. September 24–25.
American Hospital Association. Toronto. September 25–29.

FOREIGN

Fourth International Congress of Comparative Pathology. Three Sections: Human Medicine, Veterinary Medicine, and Phytopathology. Rome. May 15–20.
Fifth National Medical Congress of Uruguay. Montevideo, Uruguay. Summer of 1939.
Royal Sanitary Institute of Great Britain. Scarborough, England. July 3–8.
International Federation for Housing and Town Planning. Stockholm, Sweden, July 5–13.
Fifth International Congress on Life-Saving and First-Aid to the Injured. Zurich, and St. Moritz, Switzerland. July 23–28.
World Federation of Education Associations, Eighth Biennial Congress. Rio de Janeiro, Brazil. August 6–11. (SS. Rotterdam Summer Cruise to South America: from New York, July 5; from New Orleans, July 10; returning to New York August 27.)
International Congress of Public Health and Public Safety. Liege, Belgium. August 12–15.
Third International Neurological Congress. Copenhagen, Denmark. August 21–25.
International Congress on Public Cleansing. Vienna, Austria. August 24–28.
Eighth Pan American Child Congress. San Jose, Costa Rico. August 28–September 4.
International Conference on Sewage Works and Disposal. Glasgow, Scotland. September 12–18.
Intergovernmental Conference of American Countries on Rural Hygiene. Mexico City, Mexico. End of 1939 (postponed from November 10, 1938).

Best Sellers in the Book Service for April

Rural Health Practice—Harry S. Mustard	$4.00
Shadow on the Land: Syphilis—Thomas Parran	2.50
Taking Care of the Family's Health—Alma Rood and Gertrude Lingham	5.00
Sanitation of the Drinking Glass—Jack G. Baker and Raymond V. Stone	.25
Preventive Medicine and Hygiene—Milton J. Rosenau	10.00
Appraisal Form for Local Health Work—American Public Health Association	1.60
Control of Communicable Diseases—American Public Health Association	.30

Order from the Book Service

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